

Nova Notes

The Newsletter of the Halifax Centre of the Royal Astronomical Society of Canada



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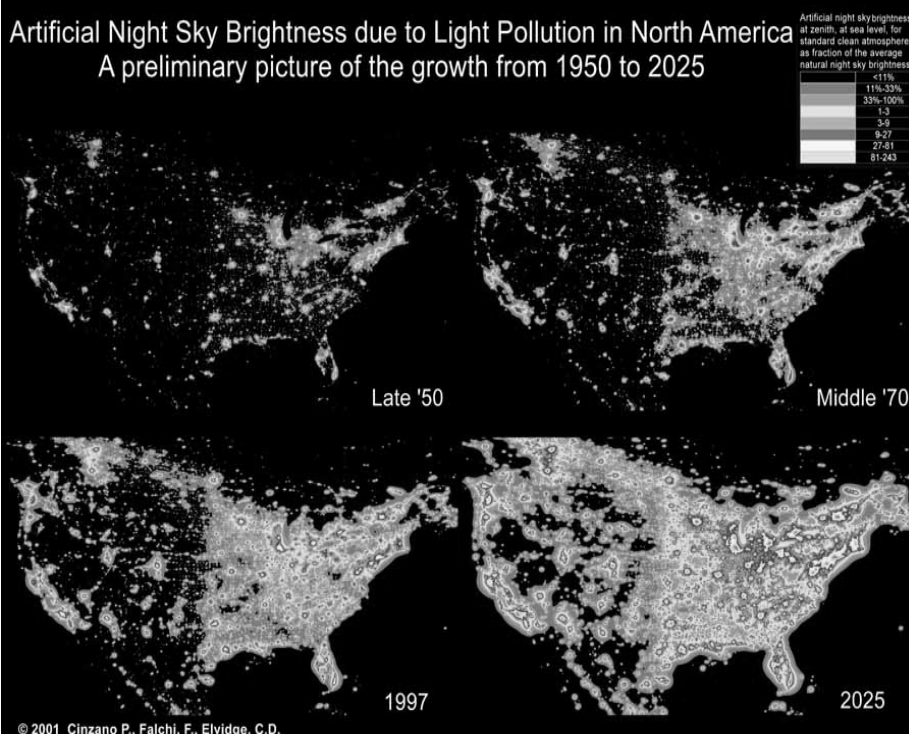
Volume 39 Number 1 February 2008

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In this issue:

Meeting announcements	2
National Council Report	3
Congratulation to Dave Lane	3
AGM (December 2007)	4/5
Treasures report	6/7
Venus and Jupiter	7
January meeting report	8/9
SCO—observing report	9
Responsible Lighting submission	10
Nova Program	10
Nova East 2008 — update	11
Cosmic debris	11
SCO	12

Artificial Night Sky Brightness due to Light Pollution in North America A preliminary picture of the growth from 1950 to 2025



From the editor

Quinn Smith

Welcome one and all to 2008. As you can see from the front page picture, in this edition of Nova Notes I would like to draw your attention to a very pressing matter in Astronomy, namely light pollution. The Centre is very active in this area, with many members involved in the Responsible Lighting Committee (formally the Light Pollution Abatement Committee). The growth of light pollution from 1950 to the present day is staggering, and it projected to grow even faster in the next 20 years.

In this edition you will find information on presentations given by the RLC at the December AGM meeting as well as a summary of a submission given by our group to the Nova Scotia's renewed "Energy Strategy and Climate Change Action Plan" hearings. With the increasing public awareness in energy savings and the environmental impact of lighting, our voices and concerns over light pollution are finally being heard.

Although it is early in the year, I would like to bring to everyone's attention the fact that next year (2009) has been designated International Year of Astronomy. This will be an excellent opportunity for us as a group to bring Astronomy (and related issues) to the general public. It's only a year away, and plans are already underway for activities in the Halifax area. The Centre's Council is looking for volunteers who would be interested in participating on a committee for planning International Year of Astronomy (IYA) activities. If you are interested, please contact Paul Evans at halifax@rasc.ca or 902-827-5977. More information on the IYA can be found at: <http://www.rasc.ca/education/iya/>

Meeting Announcements

Meetings begin at 8:00 p.m.

Meetings are held every third Friday of the month, except for the months of July and August, when there are no meetings.

Meetings take place in room 176, Loyola Building (#3 on map) at Saint Mary's University.

All members—but especially new ones—are invited to come to the meetings 20 – 30 minutes early to participate in our new informal “Meet and Greet”. It’s a chance to ask questions about astronomy, the RASC, memberships, or to just say hello.

Executive meetings begin at 7:00 p.m., and all members are welcome to attend.

Next Meeting Dates:

Please note the March meeting is on the 14th

February 15, 2008 - **Speakers night**
John Jarvo and Paul Grey will be discussing RASC observing programs.

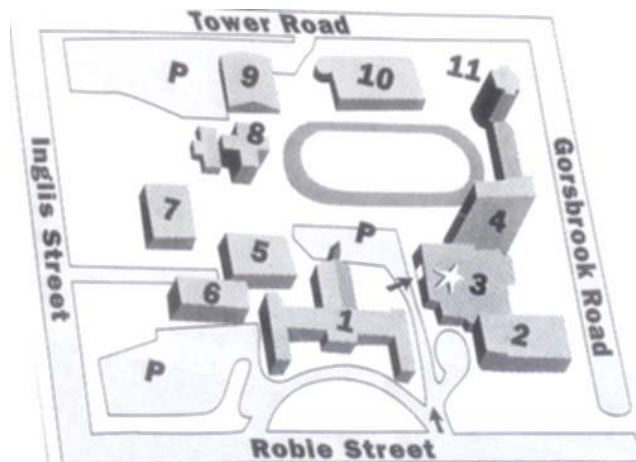
March 14, 2008 - **Speakers night**
Mary Lou Whitehorne will present a visual tour of the lives of stars, from their dusty beginnings to their interesting, and occasionally spectacular, ends. Featuring images from the orbiting Hubble Space Telescope and other leading-edge observatories, this presentation is for newcomers to astronomy.

April 18, 2008 - **Meeting night**
A regular meeting night - the program to be announced.

[The content of all meetings is subject to change]

Meeting Location:

1. McNally
 2. Sobey Building
 - 3. Loyola Academic Complex**
 4. Loyola Residence
 5. Patrick Power Library
 6. Science Building
 7. Burke Building
 8. Bookstore
 9. Alumni Arena
 10. The Tower
 11. Rice
- P Parking



Halifax RASC Executive, 2008:

Honorary President	Dr. Roy Bishop	902 542 3992
President	Paul Evans	902 827 5977
1st vice-president	Gary Weber	
2nd vice-president	Wes Howie	835-3966
Secretary	Alex LeCreux	404-5480
Treasurer	Pat Kelly	798-3329
Nova Notes Editor	Quinn Smith	852 3894
National Rep.	Pat Kelly	798-3329
Librarian	Gilles Arsenault	864 6654
Observing Chairman	John Liddard	902 865 7607
Councilor	Paul Heath	457 0610
Councilor	Jim Dorey	464-8781



National Council Report

November 24th 2007

Pat Kelly

A telephone-only council meeting was held on Saturday, November 24th 2007. I will report on only the major items that came up.

New Centre:

Subject to approval of their by-laws, the society's 29th Centre will be the Sunshine Coast Centre, which is the area along the B.C. coast north of Vancouver. If you watched the CBC show The Beachcombers, you know where it is!

Budget/Fee Increase:

The proposed budget was approved,

which predicts a deficit of about \$20,000. A continued drop in publications revenue as well as the strength of the Canadian dollar have result in decreased revenue. At the last General Assembly, the membership approved an increase in fees of up to \$4. Given the financial situation, this was approved at the council meeting, with all \$4 going to the national society. Since the bulk of renewals still occur in the fall, this will not really have a significant impact until next year. Membership numbers are up for the first time in five years.

Survey results:

The recent national survey had a 45% response rate from the 3300+ members for whom we have e-mail address. The results have been posted to the members-only section of the web site, along

with an analysis. The council will use this information when planning the long-term financial stability of the society.

International Year of Astronomy:

The United Nations has declared 2009 as the International Year of Astronomy. Plans are underway to see how the society can best mark the event. David Dunlap Observatory: The University of Toronto is divesting itself of the David Dunlap Observatory. It is hoped that the area can be saved as an astronomy park, in a manner similar to that at Mount Wilson. The society agreed to spend \$5,000 from the Northcott Fund, matching a grant from the Toronto Centre, to go towards a feasibility study. Details can be found at www.observatorypark.ca

Congratulations to Dave Lane From the editor

Congratulations to Dave Lane who was awarded the "Science Champion" award in the 5th Discovery Awards on November 29th 2007

The Science Champion award recognizes the devotion of our working scientists, technology professionals, or full time science teachers/professors in

Nova Scotia to the promotion of science and technology to the public. The recipients of this award are role models who make science fascinating and accessible.

Since 1992, David Lane has been the Astronomy Technician and High Performance Computing System Administrator at Saint Mary's University. An entirely self-taught expert, his love of astronomy began in childhood. Since the late 1980s he has been a continuous volunteer and executive member of the

Halifax chapter of the Royal Astronomical Society of Canada. He is currently the national societies' 1st vice president and incoming president for 2008. David publishes a monthly Nova Scotia star chart and is the region's voice of astronomy to the media and local community. His accomplishments include the design of the world's first Windows-based computer planetarium software, now used by thousands of people around the world, and co-discovery of several supernovas.

HALIFAX CENTRE

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PO Box 31011, Halifax, Nova Scotia, B3K 5T9

E mail: novanoteseditor@rasc.ca

Newsletter editor: Quinn Smith

Nova Notes is published bi-monthly in February, April, June, August, October and December. The opinions expressed herein are not necessarily those of the Halifax Centre. Articles on any aspect of Astronomy will be considered for publication.

Deadline for the next edition is March 20th 2008.

If you are a member who downloads the latest issue of Nova Notes from our website, you may be interested in taking your name off of the mailing list for the printed version. If so, please E mail me at the above address, with the subject line "Remove from mailing list", and you will no longer be mailed a paper copy.

Monthly Meeting Report

December 14th 2007

Wes Howie / Quinn Smith

The December meeting was the 2007 Annual General Meeting and was called to order by Centre President Paul Evans.

Paul opened the meeting with his annual President's report in which he expressed thanks to the members at large and to Executive Council for their continuing support of his Presidency and the Centre's goals and objectives. In particular, thanks were extended to the following individuals and organizations for their continued support and contributions to the RASC Halifax Centre:-

- The 2007 Nova East Committee for organizing and hosting an excellent albeit soggy Nova East.
- St. Mary's University for continuing to provide us with a monthly meeting space.
- Dave Chapman for his efforts in maintaining our Centre's web site.
- Our members who contribute at a National level (Dave Lane, Mary-Lou Whitehorne, Pat Kelly)

Paul went on to say that the Responsible Lighting Committee (formerly the Light Pollution Abatement Committee) is up and running and a presentation of their findings, directions, and goals would be given during the General Meeting portion of the evening.

Paul reported that our membership numbers remained stable for 2007 and that the recent survey of members was successful and the results would be presented during the General Meeting portion.

At this point in the meeting Treasurer Pat Kelly was introduced. Pat gave a brief but concise accounting of the state of the Center's financial position for 2007; the details of which can be found

in this edition of Nova Notes

The auditor's report deferred from 2006 was presented by our 2004/5 auditor, Johnny MacPherson. The report was as follows:

This is to acknowledge that I have performed an audit of the 2004 /2005 financial records of the RASC – Halifax Centre for adherence to generally accepted accounting principles (GAAP) and for accurate representation of the Centre's fiscal activities.

Generally, I found the receipts and disbursements to be complete and transactions chronologically correct.

However, assets are not amortized; it is not clearly understood how retained earnings were calculated; and there were also other minor entries that were difficult to understand, a negative balance for inventory, for example.

Amortization is a method of allocating cost (as an expense) over the useful life of an asset, not a method of valuation. It is possible, for example, for some asset to have a net book value of \$0, but still have a significant resale value. Although the Centre is 'not-for-profit' and depreciation is not required for calculating taxes, using the current practice retains the initial cost of assets from year-to-year and misstates retained equity.

Understanding of total equity is further confused by overstated retained earnings. The retained earnings account is to be used for closing temporary revenue and expense accounts and should not be carried over to the next fiscal period. The net income for 2004/2005 is reported as negative -\$495.82, yet the retained earnings for 2004/2005 are shown to be a positive value of \$14,873.40.

To summarize, I find the books to be an honest representation of annual transactions and well organized. However, there is difficulty in understanding balances of some accounts;

the current method for accounting of assets does not comply with GAAP; and not closing temporary revenue accounts may overstate the Centre's value of total equity.

Respectfully,
Johnny McPherson

The auditor's report for 2007 was then presented by our 2007 auditor, Dave Chapman. The report was as follows:

Auditor's report for the RASC Halifax Centre for the fiscal year 2005 / 2006.

I have reviewed the Treasurer's Report and financial records for this year and I have reasonable belief that they are free of error and that they are a true and fair account of the Centre's transactions and financial status.

The one apparent anomaly regarding revenues and sales of merchandise is explained by a one-time correction to correct a previous error regarding the value of merchandise at year-end. In time this apparent anomaly will work its way out of the Treasurer's Report.

Apart from the insurance for the Observatory, the largest recurring expense appears to be the printing and mailing of the newsletter; however, this cost scales with the number of members, and is offset by membership revenues. The Executive may wish to review the communications strategy of the Centre to see if a more economical way of producing and distributing news and articles is advisable, thus freeing up resources for other Centre needs.

David M.F. Chapman
Dartmouth, Nova Scotia

Final AGM business was the selection of the Auditor for 2008. Ian Anderson was nominated by Paul Heath, an seconded by Mary-Lou Whitehorne. He accepted the nomination .

The 2007 Annual General Meeting was adjourned, and the regular meeting continued with a brief description of the results of the membership survey

conducted in October 2007. Details of this were published in the December Nova Notes, but Paul emphasized the interest expressed for articles, presentations and events aimed at the beginner.

After Paul's report on the survey three members of the Responsible Lighting Committee (formerly the Light Pollution Abatement Committee) gave short presentations on several aspects of responsible lighting.

Paul Heath gave the first presentation in which he talked about the goals and aims of the LPA committees within the RASC.

He explained how in 1991 the Royal Astronomical Society of Canada established its Light Pollution Abatement Committee to support measures to reduce Light Pollution.

It's mission is to work for social and legislative changes which will result in better, more responsible lighting practices in Canada, and the preservation of the night-time environment for all to enjoy. This, Paul explained, is accomplished by:

- Raising public and government awareness of the problems of light pollution.
- Joining alliances with like minded groups and organizations.
- Making representations to governmental bodies

Paul then went on to explain some of the terms used in responsible lighting discussions

Light pollution is the combined effects of glare, light trespass and sky glow. In some cases light pollution can actually reduce the safety and security it is intended to provide, since light may be directed where it was not intended.

Glare is the visual discomfort resulting from insufficiently shielded light sources in the field of view. The light source itself hinders a person's ability to see details not directly illuminated by the light. This degrades safety and security. One should see the hazards, not the light source.

Light Trespass is misdirected light that invades neighbouring property. It creates a nuisance by shining into bedroom windows and other areas. Light should be directed to where it is needed.

Paul then showed two types of street lighting explaining the advantages and disadvantages of each.



This drop-lens cobra luminaire allows light to escape sideways and upwards, where it may cause problems



A flat-lens cobra luminaire, which is a full-cutoff fixture, may be effective in reducing light pollution. It ensures that light is only directed

below the horizontal, which means less light is wasted through directing it outwards and upwards.

Quinn Smith then spoke about the problems associated with residential outdoor lighting, and discussed some solutions to them.

The two main problems are energy consumption and light pollution.

Energy consumption can be reduced in many ways.

- Use lower wattage bulbs or fluorescent (if possible).
- Run lights only when needed.
- Use photo sensors, timers or motion sensors to reduce the time the lights are on.
- Turn them off!

These measures will not only save energy, but will reduce overall light pollution.

Quinn then discussed designs of light fixtures that would reduce light pollution

- Shield the bulb.
- Don't shine the light upwards.
- Don't shine the light horizontally.
- Use a reflector above the bulb.
- Have the fixture as high as is practical (shining downwards).
- Look for the IDA (International Dark Sky Association) approval.

Good lighting



Poor lighting



Basically the less the bulb is exposed the less the light pollution. Quinn noted that Home Depot carried a range of IDA fixtures. Good for them!

Gilles Arsenault finished off presentations by discussing some of the current issues being address by the Responsible Lighting Committee in both Halifax and Nova Scotia

- Increase in light pollution over the years
- Street Lighting
- Commercial Lighting
- Nova Scotia Energy Plan
- Nova Scotia Climate Change Action Plan

Gilles then summarized by giving a strategy overview, explaining how education of both the public and government would be key elements in influencing public policy.

Gilles finished by drawing our attention to the information regarding light pollution that can be found on the Centre's web site www.halifax.rasc.ca

After the meeting was formally closed, lively discussions continued on the topics presented. Finally, thank you to the cookie monster for bringing such adequate supplies of snacks and drinks.

Who said AGM's were boring!

AGM Treasurers Report

Pat Kelly

2006/2007 has been a good financial year for the Halifax Centre. At our September 30th 2007 year-end, we had a profit of \$2757.70.

Counting the observatory, we are now worth (at least on paper) just over \$50,000 with no significant liabilities.

I would like to thank Johnny McPherson, our auditor for the 2004/2005 books, and David Chapman who was the auditor for the 2005/2006 books. In the coming year, I am hoping that we will be getting some external help with our bookkeeping to try and streamline some of the ways that we do things.

Details of the 2006/2007 Income Statement

REVENUE:

Membership Fees \$3,022.54:

Membership fees are almost the same as last year. At September 30, 2006 the Centre had 164 members (139 regular, 3 youth and 22 life. Regular membership is \$55 of which \$22 is retained by Centre. The Society retains \$33 to provide nationally delivered services to members. For youth members, the numbers are \$34.25, \$13.70, and \$20.55 respectively.

Life Members Grant \$484.00:

This amount represents the life member grant we receive from National Office each year.

Donations and Observatory Donations \$686.84:

This is an increase over last year. Donations that accompany membership renewals have increased over last year.

Interest \$98.17:

This was earned mainly in our money market mutual fund,

Handbook Sales (net) \$38.30:

Handbook sales are up from last year.

Income Statement (October—September)	YEAR 06 / 07	YEAR 05 / 06	Increase over 05 / 06
REVENUE			
Membership Fees	\$ 3,022.54	\$ 3,122.91	-\$ 100.37
Life Members Grant	\$ 84.00	\$ 484.00	\$ 0.00
Donations	\$ 686.84	\$ 435.00	\$ 251.84
Interest	\$ 98.17	\$ 71.03	\$ 27.14
Handbook Sales (net)	\$ 38.30	\$ 639.16	-\$ 600.86
Merchandise sales (net)	\$ 1,631.60	\$ 0.00	\$ 1,631.60
Nova East (net)	\$ 0.00	\$ 314.22	-\$ 314.22
Miscellaneous	\$ 30.00	\$ 0.00	\$ 30.00
Total Income	\$ 5,991.45	\$ 5,066.32	\$ 925.13
EXPENSES			
Meetings & Newsletter	\$ 1,455.53	\$ 1,547.94	-\$ 92.41
Merchandise sales (net)	\$ 0.00	\$ 858.83	-\$ 858.83
Nova East (net)	\$ 153.12	\$ 0.00	\$ 153.12
Equipment & Supplies	\$ 0.00	\$ 6.89	-\$ 6.89
Office Administration	\$ 174.40	\$ 173.43	\$ 0.97
Legal Expenses	\$ 25.00	\$ 25.00	\$ 0.00
Educational Activities	\$ 0.00	\$ 137.94	-\$ 137.94
Insurance	\$ 1,043.00	\$ 1,326.00	-\$ 283.00
Awards & Donations	\$ 190.58	\$ 653.74	-\$ 463.16
Observatory - Operating	\$ 66.44	\$ 96.77	-\$ 30.33
Miscellaneous Expenses	\$ 125.68	\$ 0.00	\$ 125.68
Total Expenses	\$ 3,233.75	\$ 4,826.54	-\$ 1,592.79
NET INCOME	\$ 2,757.70	\$ 239.78	\$ 2,517.92

Sales of Merchandise (net) \$1631.60:

Sales of merchandise are back to about what would be expected given that the inventory problem from last year seems to have been resolved.

EXPENSES:

Meetings and Newsletter \$1,455.53:

This expense is down comparable to last year. \$288.05 was spent on our meeting treats. Nova Notes cost us \$452.97 to print and \$714.51 to send to our members.

Nova East (Net) \$153.12:

Nova East had a small loss this year.

Office Administration \$174.40:

This includes the cost of postage for routine correspondence, office supplies, and the rental of our post office box.

Legal Expenses \$25.00:

This is the annual fee paid to the Provincial Government to maintain our registration under the Society's Act.

Educational Activities \$0.00:

Insurance \$1,042.00:

This is entirely the insurance for the observatory. And yes, you read correctly, the insurance actually went **down** from the previous year.

Awards and Donations \$190.58:

The bulk of this in the previous year was due to the Centre returning its share of the last two membership fee increases back to the national society. This was for done just for a one-year period. Also included in this amount is \$117.14 for the Centre's membership in the International Dark Sky Association.

Observatory — Operating \$66.44:

This figure includes the \$1.15 annual land lease with the balance being for operating expenses such as batteries, cutting keys, propane for the furnace, and other operating expenses for the observatory buildings and surrounding property. There were no major expenses this year. Capital spending that has been expensed on the observatory has totalled \$21,869.64 since the project was started in the spring of 1996.

Details of the 2005/2006 Balance Sheet

Cash \$8,349.25:

This represents the cash balance at the TD Bank in Halifax on September 30, 2007 (but not including the profits from Nova East attributed to the Minas Astronomy Group and the Nova Central Astronomy Club, see below).

Cash – Nova East Profits \$1,743.78:

The Halifax Centre's portion of Nova East has been added to this amount and it now represents a fund upon which the Nova East committee can draw to cover losses in a given year. The Minas Astronomy Group and the Nova Central Astronomy Club have both agreed that this arrangement is preferable, and they are no longer involved with the fund. These funds are currently held in our regular TD bank account but recorded separately within our accounting system.

Handbook Inventory \$56.41:

Merchandise Inventory \$1258.95

This consists of our inventory of BOGS, Skyways, T-Shirts, Calendars, lapel pins, RASC stickers, RASC embroidered crests, mugs, and key chains.

Investments \$2000.00:

The Halifax Centre holds a money market account with the TD Bank.

Accrued Interest \$932.15:

Accrued interest on our money market account as reported on four quarterly statements from the TD Bank.

Balance Sheet (October—September)	YEAR 06 - 07	YEAR 05 - 06	Increase over 05 / 06
ASSETS			
Cash	\$ 8,349.25	\$ 7,990.13	\$ 359.12
Nova East Profits	\$ 1,743.78	\$ 1,264.60	\$ 479.18
Un-deposited Funds	\$ 0.00	\$ 0.00	\$ 0.00
Accounts Receivable	\$ 0.00	\$ 0.00	\$ 0.00
Handbook Inventory	\$ 56.41	\$ 0.00	\$ 56.41
Merchandise Inventory	\$ 1,258.95	\$ 483.75	\$ 775.20
Investments	\$ 2,000.00	\$ 2,000.00	\$ 0.00
Accrued Interest	\$ 932.15	\$ 835.36	\$ 96.79
Estimated Library	\$ 3,758.97	\$ 3,633.29	\$ 125.68
Observatory Equipment	\$12,131.35	\$12,131.35	\$ 0.00
Estimated Miscellaneous	\$ 452.54	\$ 452.54	\$ 0.00
Total Assets	\$30,683.40	\$28,791.02	\$1,892.38
LIABILITIES			
Accounts Payable	\$ 0.00	\$ 0.00	\$0.00
Owed to National Office	\$ 0.00	\$ 0.00	\$ 0.00
Other Liabilities	\$ 0.00	\$ 0.00	\$ 0.00
Total Liabilities	\$ 0.00	\$ 0.00	\$ 0.00
EQUITY			
	\$30,683.40	\$28,791.02	\$1,892.38
Observatory Investment (to Date)	\$21,869.64	\$21,869.64	\$ 0.00

Estimated Library \$3,758.97:

This value represents an estimate of all the money invested in the library. \$125.68 was spent on books for the library this year.

Observatory Equipment \$12,131.35:

The value of our observatory equipment.

Estimated Miscellaneous \$452.54:

These other holdings of the Centre were unchanged this year. Historically, \$250 has included a slide projector, a mirror grinding apparatus, and some

slides and material available for use at the planetarium.

Observatory Investment to Date \$21,869.64:

This amount represents the total amount of money that the Centre has spent on the St. Croix Observatory for capital expenses (*i.e.* concrete slabs, landscaping, the main observatory buildings) that are deemed to be fixed and that could not be moved if we were to leave the St. Croix site.



Venus and Jupiter

Photo by Roy Bishop Avenport Feb 1/2008

Angle of separation between the planets is about 0.6 degrees. Physically they are separated by about 700 million km of space. Jupiter (the dimmer object) is nearly 5 times more distant from us than Venus.

Technical details:

Canon XTi, 6 s, f/4.5, ISO 400, about 30 mm,
1.2 MB, 2816 x 1880 pixels, 06:35 AST

Monthly Meeting Report

January 18th 2008

Gary Weeber

Although the room was not packed as on some nights, the turnout for January's meeting was good. Once underway, Paul Evans did the round of introductions of the executive and explained the benefits of membership in the RASC. There were some short topics of discussions relating to Centre events or happenings that people should be aware of, should they wish to participate.

The first point of discussion was the program for New Observers to Visual Astronomy (NOVA). This program involves nine sessions and the Centre is trying to gauge the level of interest in order to provide instructors for the sessions.

There was also a short discussion of scheduling "Photography Night" at the Saint Croix Observatory (SCO). With the increase in the members with high quality digital cameras and the subsequent rising interest in astrophotography, it is time to have field sessions on how to address the basics of astrophotography. The first of these photographic sessions will be held at SCO Saturday, February 9th.

2009 has been designated the International Year of Astronomy. The Centre is organizing a committee to plan and organize various events throughout the year to recognize the designation. The Centre is currently seeking individuals who would like to chair or participate in a committee to steer activities for 2009 events to commemorate the International Year of Astronomy.

Paul introduced the first of the evening's speakers, Dave Chapman, who's talk was titled "Lunar Libration for Beginners". Dave pointed out that this talk was inspired by the Lunar theme of last year's Nova East.

Dave stated that the front of the Moon

is tidally locked and generally faces towards the earth, therefore one would expect to see $\frac{1}{2}$ the moon as it rotates in conjunction with its orbit. If you view the moon in all phases, it appears to wobble. Libration is a term referring to the orbital conditions which explain the wobble and makes it possible for us to see more than 50% of the moon's surface over time.

Dave introduced Kepler's first law of planetary motion: planetary orbits are elliptical with two points of focus. He also briefly discussed Kepler's second law, which is that within an elliptical orbit, equal areas of orbit are swept out in equal amounts of time, which is consistent with the conservation of angular momentum. He went on to explain that the earth is one focus of the moon's orbit and there is an empty focus as well, but in a different position than that of the earth. What allows more than 50% of the moon to be observed from earth, is that the moon revolves uniformly around the empty focus and not the earth. From our vantage, it wobbles, and this wobble is the libration in longitude. The angular difference between the moon and the two foci determine the amount of wobble from our viewing position on earth.

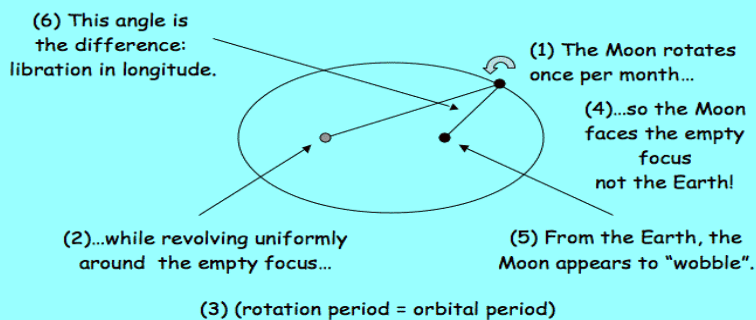
He went on to show an animation of the moon in all phases which easily showed the wobble. He also used a series of computer animated orbital examples with exaggerated eccentricities which illustrated his point very well.

Dave kept the discussion to the basics of libration in longitude and provided a clear explanation with great visual examples which communicated his points very well.

Dave Lane was the next speaker and discussed his latest accessory, the Star Spectroscope from Rainbow optics. This device looks like an eyepiece filter that has a diffraction grating that makes stars look like rainbows. This can be used photographically or visually with the magnifier that comes with it. It is possible to view the absorption lines within the star's spectrum. Dave showed a few photos he has taken through the spectroscope and explained that 75% of the star's energy goes into the main spectrum. One can also photograph the spectrum from bright nebulae. This device sells for the same price as a moderate eyepiece at about \$250.

Paul Evans then gave a brief talk on the Mercury Messenger, which is a spacecraft launched in 2004 to explore the planet Mercury. At a cost of \$446 million, it will do a number of planetary flybys before inserting itself into orbit around Mercury in 2011. On Monday January 14 of this year, it made a flyby of Mercury at a distance of 200 km and returned some photographs of the planet. Before orbiting Mercury, Messenger will complete one Earth flyby, two Venus flybys and three Mercury flybys, as well as five, self powered, deep space maneuvers.

Libration in Longitude



This is the first exploration of Mercury since the Mariner 10 spacecraft returned photos in 1975 with a 1 to 2 km resolution. Messenger will provide high resolution images and photograph previously unseen portions of the planet. It will image nearly the entire surface of Mercury in stereo.

Paul presented a series of video downloads illustrating the launch, the path for orbital insertion and the recent

approach to Mercury among others.

Next up was Roy Bishop who showed a new flashlight he recently purchased. This light combines an adjustable LED red beam, an LED white light and a green laser (5 mW). The flashlight takes three AAA batteries and is very handy for people who want all these features in one unit. It has a cord to conveniently hang off one's neck. The flashlight can be obtained online from

HoTech Corporation (<http://www.hotechusa.com/astro-aimer.html>) for approximately \$185 delivered (taxes in).

Last up for the evening was Gary Weber who gave a brief What's Up talk. The next meeting will be held on February 15th. The meeting broke for refreshments and socializing.

SCO Observing Log

Mike Gatto

Last night was a great night at SCO, even if the Moon was interfering slightly. I arrived at ~ 9 p.m. and after opening the place up, I looked around in the East, away from the Moon. I had recently picked up a Vixen LVW 22mm EP and was trying it out on some galaxies in and around Ursa Major.

I looked at M81/82 and NGC 3077, NGC 4125, M97 and 108, M109. I spent a fair bit of time on M97 with filters and different magnifications. I also nabbed a Finest NGC that I needed for my list, NGC 6543 in Draco - the cat's eye nebula. It was pretty low but still looked good, I could add any amount of magnification to it and it never seemed to dim. At one I looked at it at 600X and it was still a decent image - a bright, football shaped fuzz.

I knew then that the seeing must have been decent, but the transparency was dropping. Around this time a new member named Walt arrived and set up to take some photos.

I next went to Mars and it was great - the best I have seen it this approach, and the best I have seen it pretty much ever. Rock steady at 300x, (600x did nothing but wash out the detail). I was amazed at the detail - even though the size is now

only 14" (Starry Night). See the sketch below, (north is bottom) the right is my sketch and the left is the image from Starry night, same time. ~10.30 p.m.

The most interesting feature was near the bottom, there was a very obvious white area, that might have been clouds or ice, but there was a split that was observable. On my Mars map there is a feature named Chasma Boreale, which looks like a split in the ice at the North ice cap, this might have been it. Or it might have been atmospheric, what ever it was I was surprised to be looking at it!

In the South in the sketch there appears to be a large polar cap, but I thought that it looked more like haze than a solid ice mass, it was not highly reflective (bright white) rather it was more subtle.

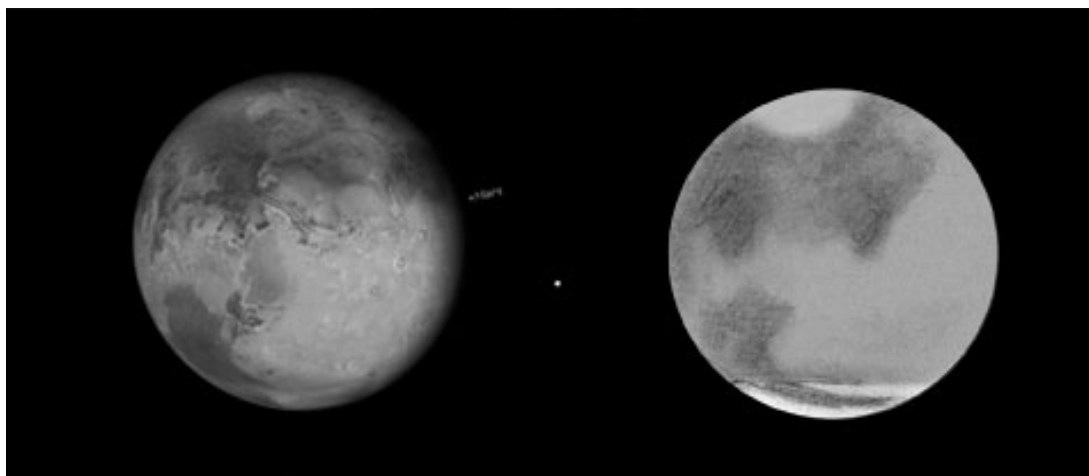
Mark Dryden showed up as well and was using the 18". I also looked at the Orion nebula, and Sirius, since the seeing was so steady the 5th and 6h stars in the trapezium were obvious.

I also looked at Saturn, which was just up and over the warm room. By 11.30 p.m. the sky was pretty murky, and Mark did a test with his sky sensor, unfortunately I can't remember what the reading was.

Saturn was cool since now the rings are very closed up. I have never seen them nearly edge on before, and so I ran some dates in Starry Night. I noted that the last time the rings were more or less edge on was in 1996.

I began observing in 1997 and did not get a telescope until sometime in 1998, so I have never seen the rings edge on before.

Mark I and left around 12 a.m. - an excellent



RLC Submission to: Nova Scotia's Renewed Energy Strategy and Climate Change Action Plan

The following is a summary of the submission made by the Centres' Responsible Lighting Committee last December (2007) titled "Responsible Outdoor Lighting – Energy Consumption and Environmental Impact"

The purpose of outdoor lighting is to create a safe environment for persons that must be outside after dark and to ensure the security of property. All stakeholders in Nova Scotia win by correcting the problems of wasteful and inefficient outdoor lighting.

Nova Scotia has approximately 150,000 streetlights at an estimated energy consumption of 70 million kW hours (2005). The greenhouse gas emitted in the process of powering streetlights alone represents about 53,000 tonnes annually. The estimated annual operating cost is over \$20 million.

Approximately 30% of the light is wasted from most existing street and roadway lighting through light shining where it serves no purpose: projected up into the sky, glaring into the eyes of drivers and pedestrians, and spilling

into areas adjacent to roadways and properties. This unused light represents not only wasteful consumption of energy and needless operating costs for all levels of government, but it detracts from the quality of life of inhabitants (both domestic and wild) by:

- unnecessary greenhouse gas (GHG) emissions and air pollution from hydrocarbon-powered generating stations, contributing to global climate change,
- degraded safety and security from glare and light trespass, and
- washout of the starry night sky (part of our heritage) behind the reflected glow of wasted light.

The Royal Astronomical Society of Canada (Halifax Centre) strongly believes that the Province of Nova Scotia can in part achieve its goals of reducing energy consumption, improving energy efficiency, and reducing GHG emissions by responsibly evaluating and changing its lighting practices and by formulating policy for itself and for other levels of government. Further savings would follow from a similar policy governing commercial lighting. Such a strategy would yield collateral benefits such as energy cost savings, enhancement of quality of life, improvement in safety and security, and protection of the environment.

In addition to the aesthetic benefits of

responsible lighting, Nova Scotia taxpayers can realize significant real dollar savings as well as a reduction in greenhouse gas emissions of about 16,000 tonnes per year, by only considering street lighting. These reductions would increase considerably if unnecessary street lights were removed or residential and commercial outdoor lighting were included.

This submission is in line with Nova Scotia's Renewed Energy Strategy and the Climate Change Action Plan, particularly with respect to the focal points "using less energy", "leading by example", "air quality", "government action", and "government intervention".

The RASC is a society that deals with light. In pursuing their studies, astronomers—both professional and amateur—have become expert at gathering and interpreting information from very faint and distant light sources. Naturally, astronomers notice the negative aspects of bad lighting long before anyone else, and have become champions of responsible outdoor lighting. In a sense, we have become "the canaries in the coal mine".

Thanks to the RLC for their great work on this submission. The full text can be found at <http://halifax.rasc.ca/responsiblelighting.html>

Nova Program

Sean Dzafovic

The Halifax Centre of the RASC will be running a local version of the NOVA Program (New Observers for Visual Astronomy). This program was developed by the Prince George Centre of the RASC to educate people new to the hobby. To quote from the Prince George Centre web site:

"The objective of the program is to

provide new members with basic astronomy knowledge and skills to enable them to become proficient amateur astronomers and to foster an environment wherein new members may quickly become active, participating members of the Centre."

We are looking to gauge interest from new Centre members before advertising further afield. This program will be starting in March or April and will consist of 9 sessions, which will probably be run on a bi-weekly schedule. The full syllabus can be found on the RASC

national web site <http://www.rasc.ca/private/resources/nova.shtml>.

If you think you, or someone you know, would be interested in taking part, please contact Sean Dzafovic at sdzafovic@gmail.com or Paul Evans at evans@eastlink.ca.

We are also looking for members who may be interested in teaching one or more of the NOVA program sections. Volunteers should contact either Sean or Paul at the emails listed above.

Nova East 08 - update

Roy Bishop

Last weekend the Nova East Committee approved the program for this year's Nova East, which will be held at Smileys Park over the long weekend: Friday August 29 to Monday September 1.

Nova East 2008 will be bigger and better than ever, with nine presentations and two tours extending from Saturday morning through Sunday evening, and, weather permitting, three nights of dark-sky observing. The keynote speaker will be Terence Dickinson.

Terence Dickinson, Canada's preeminent astronomy writer and amateur astronomer, begins the program on Friday evening and will be staying through to Monday. Dickinson replied to our invitation "Put me down in ink. I'm really looking forward to it."

A new item on the program is an "Awesome Astronomy Auction". Everyone is invited to donate gear they no longer need, for the auction. All \$ raised by the auction will go into the Nova East account, to the benefit of Atlantic Canada's largest star party in future years. All for a good cause, and for an especially exciting event at Nova East 2008.

Mark your calendar now for the astronomy highlight of 2008 in Atlantic Canada!

The Nova East 2008 Committee:
Chris Beckett (Door prizes)
Roy Bishop (Program)
Ron Mills (Program)
Irene Moore (Registration and website)
Dave Parsons (Registration)
Advisors: Daryl Dewolfe and John Jarvo

By the time you read this the Nova East 2008 website should be up-to-date, including the program.
Go to: www.halifax.rasc.ca and follow the links

Cosmic Debris

Odds & sods from the world of Astronomy and Cosmology

The NASA Deep Space Network - or DSN - is an international network of antennas that supports interplanetary spacecraft missions and radio and radar astronomy observations for the exploration of the solar system and the universe. The network also supports Earth-orbiting missions.

On February 4th 2008 at 4 p.m. Pacific Time NASA will for the first time ever, intentionally beam a song (The Beatles "Across the Universe") directly into deep space.

The transmission over NASA's Deep Space Network will commemorate the 40th anniversary of the day The Beatles recorded the song, as well as the 50th anniversary of NASA's founding and the group's beginnings. Two other anniversaries also are being honored: The launch 50 years ago this week of Explorer 1, the first U.S. satellite, and the founding 45 years ago of the Deep Space Network.

Technicians at NASA's Jet Propulsion Laboratory, Pasadena, Calif., where the Deep Space Network is managed, will send the command that will start the transmission.

The transmission is being aimed at the North Star, Polaris, which is located 431 light years away from Earth. The song will travel across the universe at a speed of 186,000 miles per second. Former Beatle Sir Paul McCartney expressed excitement that the tune, which was principally written by fellow Beatle John Lennon, was being beamed into the cosmos. "Amazing! Well done, NASA!" McCartney said in a message to the space agency. "Send my love to the aliens. All the best, Paul."

Lennon's widow, Yoko Ono, characterized the song's transmission as a significant event. "I see that this is

the beginning of the new age in which we will communicate with billions of planets across the universe," she said.

It is not the first time Beatles music has been used by NASA; in November 2005, McCartney performed the song "Good Day Sunshine" during a concert that was transmitted to the International Space Station. "Here Comes the Sun," "Ticket to Ride" and "A Hard Day's Night" are among other Beatles' songs that have been played to wake astronaut crews in orbit. For information about the DSN, go to:
<http://deepspace.jpl.nasa.gov>

Useful information from Roy:

Humans have been sending songs "directly into deep space" for nearly a century via radio and television transmissions. The Beatles song "Across the Universe" is already some 40 light-years out, an expanding bubble of electromagnetic radiation that has already passed all the stars listed on pages 265 and 266 of the Observer's Handbook. NASA's transmission planned for February 4 will never catch up.

Useless information from the Editor:

"Across the Universe" was never originally intended to be released by The Beatles. John and the "boys" had made a demo tape at the Abby Roads studio in London, but, not liking the result, literally threw it out into the garbage. Kenny Everett, a well known British (eccentric) disc jockey, was a major Beatle fan. It was not unknown for him to raid the garbage of the Abby Road studio for interesting pieces of information. Well of course, he found the discarded tape (covered in jam!), cleaned it off, and played it on his radio station. Due to the overwhelming response to the song The Beatles decided to re-record it and the rest, as they say, is history.



St. Croix Observatory

Observing Chair: John Liddard 902 865 7607

Part of your membership in the Halifax RASC includes access to our observatory, located in the community of St. Croix, NS. The site has grown over the last few years to include a roll-off roof observatory with electrical outlets, a warm-room and washroom facilities. Enjoy dark pristine skies far away from city lights, and the company of like minded observers searching out those faint “fuzzies” in the night.

Members’ Night:

Every weekend closest to the new Moon, there is a Members’ Night at St. Croix. The purpose of Members’ Night is to attract members from the Centre to share an evening of observing with other members. It’s also a great night for beginners to try out different scopes and see the sky under dark conditions. For more information or transportation arrangements, please contact the Observing Chair.

Future dates for Members’ Nights:

February	8th,	2008
March	7th,	2008
April	4th,	2008
May	2nd,	2008
May	30th,	2008
July	4th,	2008

These dates are all Fridays. If this is a meeting night, or cloudy, the alternate date will be the following Saturday.

Directions from Halifax:

- 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 1.5 km until you cross the St. Croix River Bridge. You’ll see a power dam on your left.
5. Drive about 0.2 km past the bridge and take the first left (Salmon Hole Dam Road).
6. Drive about 1 km until the pavement ends.
7. Drive another 1 km on the dirt road to the site.
8. You will recognize the site by the 3 small white buildings on the left.

Become a St. Croix Key Holder:

For a modest “key fee”, members in good standing for more than a year, who have been briefed on observatory , may gain access to the St.Croix facility. For more information on becoming a key holder, contact the Observing Chair.

Rules for using the SCO equipment:

There are several pieces of astronomical equipment available for members (and guests) to use, including a 17.5” dob and a magnificent pair of tripod mounted, 100mm binoculars. If you are unfamiliar with the use of these pieces of equipment, please ask for assistance—any knowledgeable member would be more than willing to help you out. Please share the equipment with other members; and treat the equipment, the facilities, and the site with respect. Enjoy!