

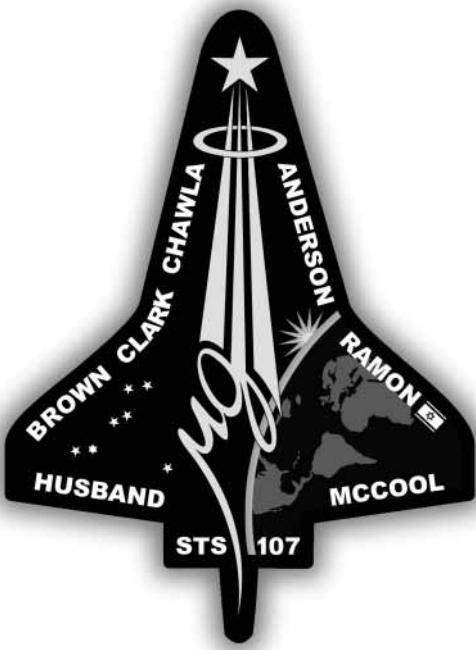
Nova Notes

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



Volume 34 | Number 1 | February 2003

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COLUMBIA

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President's Report

Mary Lou Whitehorne

By the time you read this, Steve Tancock will be well established as Centre President. I will have resumed my cherished spot, reserved for past presidents, in Heckler's Row. How delightful!

All kidding aside, it was a pleasure to serve as president in 2002. The Centre had a truly great year. Not that this was any of my doing, for it certainly wasn't! It was all due to the efforts of many other RASC members. I thank everyone: all the members of the executive, and all those other active Centre members who contributed so much to the life of the Centre over the past year. Without them, it would have been a dull and boring year indeed.

Several things are worthy of mention. Attendance at meetings has increased. This reflects an increase in memberships in both the Halifax Centre and in the society as a whole. I'm not sure why this is so, but it could be due to the improvements in member service from national office, the flexibility of a revolving membership year, the ability to renew memberships online, the inclusion of Sky News as a benefit of membership, or all of the above. Locally, the move to St. Mary's as our meeting place might be a significant

contributing factor. Our 1st VP has also been working hard at promoting our meetings to the public. That may have something to do with it as well. Of course, the wonderful speakers, good munchies and general fun we enjoy at the meetings cannot be discounted! Plus, we have an observatory and word gets out about these things...

Our St. Croix Observatory has been very busy. This has been a record year for activity at SCO. We have a new 17.5-inch "light bucket" telescope. The C-8 has been sold, allowing us to consider the purchase of another user-friendly, beginner's scope for members' use. There is a growing crowd of regular gazers who use the place. In fact, it's getting so busy that we have formed a committee* to begin planning for the future of SCO. Expansion of the facility is under active consideration.

Our public events were also well attended in 2002. The sidewalk astronomy event was very successful on the Dartmouth waterfront and we will go back there in 2003. Nova East 2002 was the best yet. The move to Smiley's Park was the right thing to do. Now we have lots of our own members coming to Nova East, volunteering and participating in many ways. 2002 saw the largest turnout in 16 years. Everybody had a wonderful time and the organizers deserve a big vote of thanks for a job extremely well done.

What else is there to say? The Halifax Centre is THE place to be for amateur

astronomy in Nova Scotia. Thanks for all the fun. I'll see you on the third Friday of the month!

Mary Lou Whitehorne
President

*Here are two completely irrelevant committee jokes:

q. What has at least six legs and no brain?
a. A committee.

q. What has at least six legs but can't get anywhere?
a. A committee.

Good quotes:

"Astronomy teaches the correct use of the sun and the planets."
– Stephen Leacock

"Astronomy: a great science by which man learns how small he is."
– Evan Esar ☆



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Articles on any aspect of Astronomy will
be considered for publication.

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.

"Letters to the Editor" or letters to our resident expert "Gazer" are also most welcome.

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Nova Notes is also available as a PDF file on our centre's website at www.halifax.rasc.ca

Material for the next issue should reach the editor by Mar. 28

Secretary's Report

Craig Levine

Halifax Centre

Membership

2002 was a positive year for the Halifax Centre. President Mary Lou Whitehorne presided over a growing membership, with numbers currently just shy of 200. Monthly meetings are held at St. Mary's University in a classroom that is equipped for audio-visual presentations. With the number of members coming out for meetings rising, we are faced with the pleasant task of considering a larger venue. Credit to the growing attendance can be given both to the interesting and varied keynote speakers, and to the meeting notices placed in prominent media outlets.

Nova Notes has blossomed under the deft hand of Editor Michael Gatto. The newsletter is the voice of the Centre, and Michael has made sure that the members are front and centre inside. Michael's background in Communication Design clearly shows in the layout.

The Centre executive and general membership were proud to learn that Dr. Roy Bishop, Centre Honorary President, editor of The Observer's Handbook for 19 years, former national RASC President, and currently national Honorary President was awarded the Chant Medal by the RASC for 2001.

St. Croix Observatory

Observing Chair Dave Lane oversaw the Centre observing programs and observatory facility. The 2002 work party became a well-attended social event. Also of note was the completion, by incoming 2003 President

Steve Tancock, of the Halifax Centre's 17.5" truss telescope. The telescope and its construction were featured in the Jul/Aug edition of SkyNews. The furnace in the warm room was upgraded as well.

The observatory hosts "Members' Night" on the Friday closest to the New Moon each month. Members are encouraged to come out and share the views on these nights. In March a beautifully clear night with the promise of an aurora brought over thirty members out to share the experience. Other Members' Nights have also been well attended.

A management committee was struck to plan future development of the observatory property. First priority will be an expansion of the gravel pad to accommodate the growing number of telescopes, particularly large Dobsonians, that are making regular use of this unique facility.

Public Education and Outreach

Light Pollution Abatement

Anthony (Tony) McGrath took the initiative in bringing the issue of responsible lighting to city hall. The city solicited input from interested groups regarding long-term municipal planning, taking into account quality of life of the residents, cost savings etc. Tony wrote up a professional draft proposal for the city highlighting the benefits of a responsible lighting policy.

Sidewalk Astronomy

August saw several members arrive on the waterfront for a public observing session at the Alderney landing complex. Several members showed up with a variety of optical instruments covering the full range of available equipment. The lineups were long, and there was no end of questions and exclamations of delight at the images. It was such a success the Alderney Landing facility

invited the Centre to participate in another upcoming event.

Centre Meetings

The main talks at the monthly meetings were varied this year. The talks included:

January: David Chapman. "A Date with the Stars: the Astronomical Basis of Our Calendar"

February: Craig Levine. "Globular Clusters: Much More Than What Meets the Eyepiece"

March: Fr. William Lonic. "The Galileo Affair: A Speeding Ticket Gone Sour"

April: Daryl DeWolfe. "Caroline Lucretia Herschel"

May: Rollie Strand, Pat d'Entremont, Craig Levine. "Observa-stories". Active new members share their astronomy experiences.

June: Pat Kelly: "Game Show: Who Wants to be a Gazer?"

September: Paul Gray: "Recent Star Parties"

October: Dr. Francis LeBlanc: "Stars and Their Spectra"

November: Dr. Rajiv Gupta: "Imaging the Heavens"

December: Blair MacDonald; "A Non-Physicists Look at Black Holes"

Regular components of the general meetings include the library cart, equipment talks, a "What's Up" segment, and a selected topic from the Observer's Handbook.

Nova East

Nova East, organized jointly by the Centre, Minas Astronomy Group (MAG), and the Nova Central Astronomy Club (NCAC), was a success. It is held annually at Smiley's Provincial Park in Hants County. Nature walks, solar observing, rocket launches, and children's events took over the daytime hours, and the good weather held to allow some observing. *

Treasure's Report

Paul Evans

(as of November 20, 2002)

2001/2002 has been a solid financial year for the Halifax Centre. In my first year as treasurer I have learned a great deal.

At our September 30th year-end, we had a surplus of \$1,487.81. Membership levels have increased slightly over last year to 192 from 180. Counting the observatory, we are now worth (at least on paper) \$41,675.32 and have no significant liabilities. Below are some explanatory details pertaining to the Income Statement and Balance Sheet.

Respectfully submitted,
Paul Evans, Treasurer

DETAILS OF THE 2001/2002 INCOME STATEMENT

Revenues:

Membership Fees \$2,834.06:

Membership fees were up slightly from last year.

Life Members Grant \$492.80: Our grant from National Office was up slightly. Currently we have 28 life members.

Donations and Observatory Donations

\$250.00: The centre received these generous donations from its members.

Interest \$61.42: This was earned mainly in our money market mutual fund, which included the final quarter of the previous fiscal year but not the interest received during the final quarter of this fiscal year. Interest earned in lower than last year due to lower interest rates. Our bank account earns very little interest.

Handbook Sales (net) \$432.85: Handbook sales were up about 32% over last year.

Sales of Merchandise (net) \$646.37:

Merchandise sales were lower than last year – which was an extremely strong year. Handbook sales were up and calendar sales were down.

Nova East (Net) \$711.79: Nova East made a strong profit this year. Following a motion of the executive at its September 1999 meeting, two-thirds of this profit is to be recorded as profit earned by the other two astronomy clubs that co-hosted Nova East. Ordinarily, the RASC would have paid this profit to these clubs, however neither the Minas Astronomy Club nor the

Nova Central Astronomy Club have bank accounts. See Assets – Cash below.

Expenses:

Meetings and Newsletter \$1,573.60: This expense is up over 20% from last year reflecting a larger Nova Notes and well attended meetings. \$265.14 was spent on our meeting treats, prizes, and meals for out-of-town speakers. Nova Notes cost us \$621.07 to print and \$687.39 to send to our members.

Office Administration \$269.08: This includes the cost of postage for routine correspondence, office supplies, and the rental of our post office box. This past year required the purchase of accounting software for the treasurer.

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: No expenditures were classified under educational activities this year.

Insurance \$769.00: This is entirely the insurance for the observatory. Our insurance costs increased by 48% over last year.

Observatory — Operating \$606.13: This figure includes the \$1 annual land lease and some operating expenses such as gas for the generator, propane for the furnace, and bug spray! Also included are the property taxes, which amounted to only \$23.80. The majority of the increase in this line item over last year was for a required propane inspection of our new furnace. Capital spending that has been expensed on the observatory has totalled \$19,584.01 since the project was started in the spring of 1996.

Miscellaneous Expenses \$530.10: This item is mostly travel expenses for sending our National Council Representative to Toronto for two meetings and the Centre's membership in the International Dark Sky Association.

2001/2002 BALANCE SHEET DETAILS

Assets:

Cash \$2,583.78: This represents the cash balance at the TD Bank in Halifax on September 30, 2001 (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 \$955.92: This represents two-thirds of the profits from the 2002, 2001 and 2000 Nova East star parties which are attributed to the Minas Astronomy Group and the Nova Central Astronomy Club (see Expenses – Nova East above). This profit is currently held in our regular TD bank account but recorded separately within our accounting system.

Undeposited Funds \$800.00: This represents cash and cheques that were on hand but not deposited at year-end.

Merchandise Inventory \$1,729.24: This consists of our inventory of 16 T-Shirts, 86 2003 Calendars, 31 centre pins, 4 bumper stickers, 90 RASC stickers, 19 RASC embroidered crests, 6 RASC mugs, and 15 RASC key chains.

Investments \$2,000.00: The Halifax Centre holds a money market account with the TD Bank.

Accrued Interest \$624.46: Accrued interest on our money market account as reported on four quarterly statements from the TD Bank. This includes income from the last quarter of the previous fiscal year but does not include income from the last quarter of this year since it was not known at the time that the statements were prepared.

Estimated Library \$3,395.01: Our library's value is an estimate of all money spent there since the beginning, including \$318.41 spent this year to purchase four new books.

Observatory Equipment \$10,528.61: This year significant equipment investment was made. \$571.95 was spent to complete the 17.5" telescope project. \$356.34 was spent on a 4.5" loaner scope with accessories and materials for a carrying case. \$1,059.42 was spent on purchasing and installing a new propane furnace in the SCO warm room. \$349.54 was spent on other telescope accessories.

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.

Liabilities:

Accounts Payable \$1,096.85: At year-end, the centre owed the National Office for a shipment of year 2003 Calendars and Handbooks that were received during September 2001.

ROYAL ASTRONOMICAL SOCIETY OF CANADA, HALIFAX CENTRE
Comparative Income Statement for 2000/2001 and 2001/2002 Membership Years

	Year Oct 2001 to Sept. 2002	Year Oct 2000 to Sept. 2001	Increase over 2000/2001
REVENUE			
Membership Fees	\$ 2,834.06	\$ 2,587.23	\$ 246.83
Life Members Grant	492.80	448.00	44.80
Donations and Obs. Donations	250.00	535.00	-285.00
Interest	61.42	113.24	-51.82
Handbook Sales (Net)	432.85	326.71	106.14
Sales of Merchandise (Net)	646.37	1,135.43	-489.06
Nova East (Net)	711.79	247.64	464.15
Miscellaneous	\$ 0.00	\$ 0.00	\$ 0.00
Total Income	\$ 5,429.29	\$ 5,393.25	\$ 36.04
EXPENSES			
Meetings & Newsletter	\$ 1,573.60	\$ 1,294.57	\$ 279.03
Equipment & Supplies	0.00	0.00	0.00
Office Administration	269.08	184.12	84.96
Legal Expenses	25.00	25.00	0.00
Educational Activities	0.00	46.00	-46.00
Insurance	769.00	519.00	250.00
Awards & Donations	168.57	0.00	168.57
Observatory - Operating	606.13	288.63	317.50
Miscellaneous Expenses	\$ 530.10	\$ 331.54	\$ 198.56
Total Expenses	\$ 3,941.48	\$ 2,688.86	\$ 1,252.62
NET INCOME	\$ 1,487.81	\$ 2,704.39	\$ -1,216.58

COMPARATIVE BALANCE SHEET FOR 1999/2000 AND 2000/2001 MEMBERSHIP YEARS
Comparative Balance Sheet for 2000/2001 and 2001/2002 Membership Years

	Year Oct 2001 to Sep 2002	Year Oct 2000 to Sep 2001	Increase over 2000/2001				
ASSETS							
Cash	\$ 2,583.78	\$ 4,464.36	\$ -1,880.58				
Nova East Profits (MAG/NCAC)	955.92	481.39	474.53				
Undeposited Funds	800.00	127.00	673.00				
Accounts Receivable	77.40	0.00	77.40				
Handbook Inventory	41.20	0.00	41.20				
Merchandise Inventory	1,729.24	1,415.39	313.85				
Investments	2,000.00	2,000.00	0.00				
Accrued Interest	624.46	565.11	59.35				
Estimated Library	3,395.01	3,076.60	318.41				
Observatory Equipment	10,528.61	8,191.36	2,337.25				
Estimated Miscellaneous	\$ 452.54	\$ 452.54	\$ 0.00				
Total Assets	\$ 23,188.16	\$ 20,773.75	\$ 2,414.41				
LIABILITIES							
Accounts Payable	\$ 1,096.85	\$ 176.55	\$ 920.30				
Est. Handbook Payable	0.00	0.00	0.00				
Fees owed to National Office	0.00	0.00	0.00				
Other Liabilities	\$ 0.00	\$ 0.00	\$ 0.00				
Total Liabilities	\$ 1,096.85	\$ 176.55	\$ 920.30				
EQUITY							
	\$ 22,091.31	\$ 20,597.20	\$ 1,494.11				
Observatory Investment to Date	\$ 19,584.01	\$ 19,584.01	\$ 0.00				
Approved by:	Paul Evans, Treasurer	Mary Lou Whitehorne, President					
MEMBERSHIP	1996	1997	1998	1999	2000	2001	2002
	127	135	164	157	164	180	192

Proposal for New Markings for the Seaview Park Sundial, Halifax, Nova Scotia

David M.F. Chapman

For some time, the poor markings on the sundial at Seaview Park, Halifax (the former site of Africville) have bothered me. (See Figure 1.) The sundial was erected in 1988, when I was away, so I learned about the sundial's existence when I returned late that year: it was a fait accompli. To make a long story short, the markings for the hours indicate the wrong times. I wrote about this in my JRASC Reflections column of April 1998, which is available online at

<http://www3.ns.sympatico.ca/dave.chapman/journal/JRASC1998-04.html>

A few years ago, I tried to interest the municipal authorities in this problem, with no success. I tried again later by sending an email to the Halifax Parks Department, with no response. Finally, this year, when the Hon. Sheila Copps declared Africville a National Historic Site, I tried again. I wrote to the Minister, with copies to local MPs, MLAs, the Mayor of HRM, and community leaders. The Mayor answered, asking me to contact the Head of his Parks Department; someone answered on behalf of the Minister, expressing interest, but declaring the sundial to be within the municipal jurisdiction. So far, so good. At a summertime

meeting with the Parks Department at the actual site, I quickly convinced them that there was a problem, and I was invited to propose a solution. It was determined that the sundial could be repaired by leaving the gnomon alone and carefully removing the 4 quarters of the annular granite dial for re-cutting. Perhaps the stones could be turned over, polished, and cut with the correct markings. The following is what I submitted on September 11, 2002. To date, there have been no further developments.

As the current hour marks are incorrect, new marks are proposed to indicate correct standard time at the location of the Seaview Park sundial (apart from the meridian transit time correction, see page 100 in the 2003 Observer's

Handbook). As shown in the diagrams, the hour lines (along which the shadow of the gnomon falls) must converge at the south corners of the gnomon, according to which edge casts the shadow. It is proposed that the hour lines be marked on the dial as in Figure 2 to aid in reading the time. (An option is provided in Figure 3 without hour lines). The numerals may be oriented in any way, as long as they are roughly in the middle of the annular ring of granite and aligned with the hour lines. The correction for longitude within the time zone has been included, as Halifax mean solar time is 14 minutes behind mean solar time at the standard meridian. (In other

words, Noon standard time takes place 14 minutes before the Sun is due south.) Finally, Figure 4 is a layout sheet with hour lines only that may help the stone cutters.

Figure 1. The Seaview Park sundial. The solid line at the toe of the gnomon is the E-W line that should indicate the hours of 6 A.M. and 6 P.M., respectively, in local mean solar time. It looks like the builders imagined that these hour lines belonged closer to the centre of the dial (dashed line) but even this plan was not executed successfully.

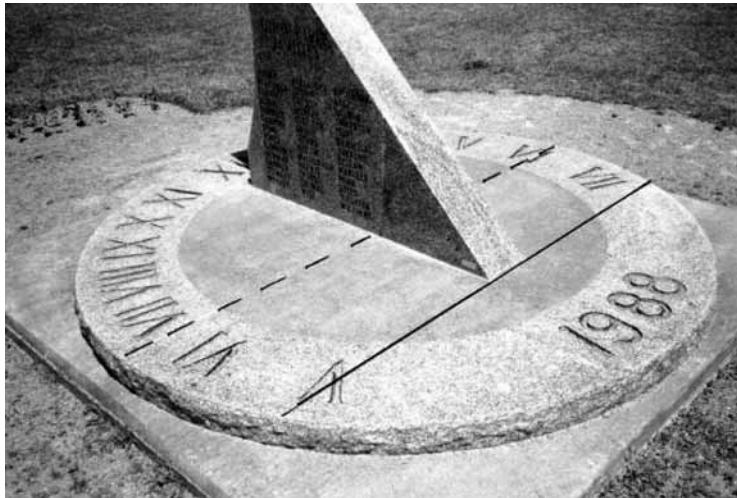


Figure 1.

Figure 2. The proposed new markings for the Seaview Park sundial, Halifax, showing Atlantic Standard Time, the appropriate standard time zone for Halifax.

Figure 3. As in Figure 1, but with numerals only, no hour lines.

Figure 4. The finite width of the gnomon requires that the positioning of the hour lines must be considered carefully, according to which edge actually casts the shadow. *

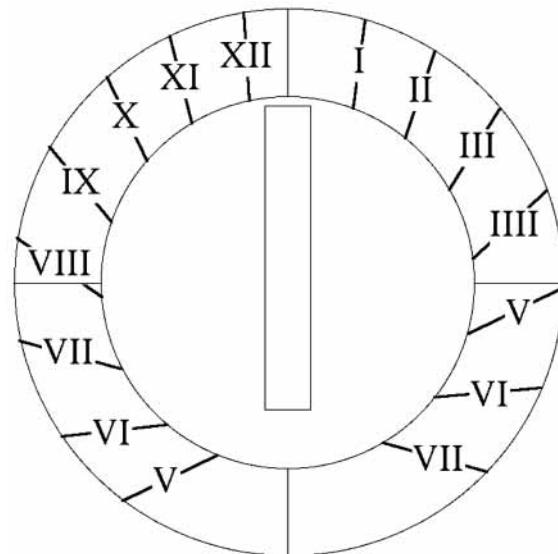


Figure 2.

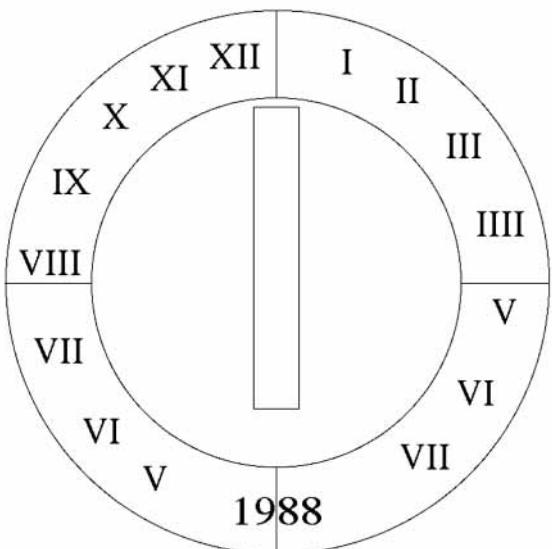


Figure 3.

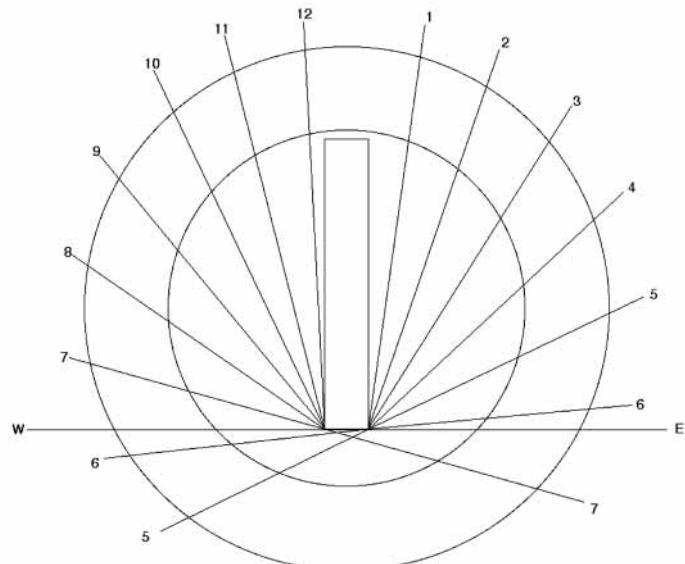


Figure 4.

December Meeting Report

Pat Kelly

Mary Lou Whitehorne started her last meeting as centre president with the gentle tinkling of a bell — a far cry from the gavel pounding she uses to start executive meetings! She barely was able to conceal her enthusiasm for returning once again to Heckler's Row, the seating area reserved for past presidents.

The topic of the meeting's main presentation, black holes, is guaranteed to generate a lot of interest. We had so many people show up that we had to bring in extra chairs from a neighbouring classroom. A very impressive turnout, especially considering that the evening was also the opening night for *Star Trek: Nemesis*.

Blair MacDonald began his presentation by correcting the title of his lecture from *Black Holes for Dummies* to *Black Holes by a Dummy!* He then laid a few common myths to rest (e.g. black holes are celestial vacuum cleaners sucking up everything in their path) by explaining what black holes were not; and then by relating what we think they are.

He then looked at how black holes form by looking at what happens to stars that reach the end of their lives — that point at which the star is no longer capable of producing energy to counteract gravity's continual attempt to compress the star into a smaller object. Regardless of the star's mass,

gravity can always wait until the source of nuclear fuel is exhausted. (As Red Green would say, Gravity is always there.) A star with a final mass of up to 1.4 solar masses will result in a white dwarf; a star with a final mass of 1.4 to 2 solar masses will collapse to produce a neutron star. For a final mass of over 2 solar masses, no force known can stop the collapse, and the end product is a black hole.

Einstein's general theory of relativity (1915) predicted black holes but could not explain what went on inside them. Special relativity, which was able to deal with accelerated frames of reference lead to the understanding of gravity as the warping of space-time by the presence of mass. Blair even showed us one of the field equations from relativity theory and explained it with the phrase "enough said", and then went on, to the relief of the audience! Chandrasekhar later showed that the collapse of a massive star would result in the formation of a singularity, a point where the volume became zero and the density infinite. It was not until 1969 that John Wheeler coined the term "black hole" to describe the area around the singularity.

The structure of a black hole is relatively simple, especially if it is not rotating. It consists of a singularity surrounded by a spherical region. The surface of the sphere is the region in which the velocity needed to escape from the black hole's gravitational pull is equal to the speed of light and is called the event horizon. Things are a bit more complicated for spinning black holes, but all black holes can be described completely with numbers that measure

$$\begin{aligned} \Lambda^{\alpha\beta} = & - h^{\mu\nu} \partial_{\mu\nu}^2 h^{\alpha\beta} + \partial_\mu h^{\alpha\nu} \partial_\nu h^{\beta\mu} + \frac{1}{2} g^{\alpha\beta} g_{\mu\nu} \partial_\lambda h^{\mu\tau} \partial_\tau h^{\nu\lambda} \\ & - g^{\alpha\mu} g_{\nu\tau} \partial_\lambda h^{\beta\tau} \partial_\mu h^{\nu\lambda} - g^{\beta\mu} g_{\nu\tau} \partial_\lambda h^{\alpha\tau} \partial_\mu h^{\nu\lambda} + g_{\mu\nu} g^{\lambda\tau} \partial_\lambda h^{\alpha\mu} \partial_\tau h^{\beta\nu} \\ & + \frac{1}{8} (2g^{\alpha\mu} g^{\beta\nu} - g^{\alpha\beta} g^{\mu\nu}) (2g_{\lambda\tau} g_{\epsilon\pi} - g_{\tau\epsilon} g_{\lambda\pi}) \partial_\mu h^{\lambda\pi} \partial_\nu h^{\tau\epsilon}. \end{aligned}$$

just three properties: mass, electric charge, and spin.

One of the weird effects that occurs near a black hole, which arises from relativity theory, is that the incredible warping of space-time that occurs near the event horizon also causes time to slow down the closer that you approach the black hole. Theoretically, at the event horizon time should stop, so Blair raised the issue of whether you could actually pass through the event horizon. The answer is "Yes", because time only appears to stop from the point of view of an observer watching the object reach the event horizon. From the object's point of view, time would continue at its usual rate, allowing the object to cross the event horizon and encounter the singularity.

It was a very interesting presentation, and gave many people a new appreciation of these fascinating objects.

Following the refreshment break we had a number of short presentations. The first was titled *The Colours of the Stars* by David XVII Chapman. (The XVII refers to the fact that he is the seventeenth member inducted into the RASD, the Royal Astronomical Society of Daves.) He missed the November meeting as he was away in Australia, and several days before leaving he purchased a new 4-megapixel digital camera. If desired, the camera can be operated completely manually, where you can set the focal length, shutter speed, even the ASA of the "film". David noted that one of the "advantages" of the 36-hour plane trip was that he had a chance to fully read the manual! He was taking pictures of the Southern Cross and found that one of them had been accidentally taken while the camera was out of focus. On closer inspection he found that the "blobs" made by the stars showed

their colours very nicely. When he checked the spectral classifications of the stars, he came across an unexpected mystery. Alpha and Beta Crucis, the two brightest stars were white, but both are B-type stars and should have appeared blue. The mystery was solved when he determined that he had actually overexposed those stars, saturating the CCD chip in the camera. Since Cassiopeia is in the opposite part of the celestial sphere from Crux, he decided to take some images of it on his return, and showed us some of the gorgeous shots that he had obtained. The number of faint stars was truly amazing.

Next up was Dave Lane (also a member of the RASD) with the "What's Up" talk. For someone who only remembered that he was supposed to do it at 7:05 P.M. and only got a handbook at 7:45 P.M., I thought he did a wonderful job! He reported that the Geminid meteors would have been visible tonight, if it had not been cloudy. Paul Gray and Bob Hawkes had hoped to use sensitive video cameras to simul-

taneously observe the unlit part of the Moon to look for impacts.

On to the planets! Saturn is putting on a spectacular show. Dave reported that this was the first time he had been able to see Cassini's Division completely. Jupiter is about to enter a period where there would be numerous opportunities to observe double shadow transits. Although he does not get up early enough to see Venus, he knows that it is nice and bright as he is starting to get calls at work from people asking about "that really bright thing in the morning sky".

Lastly, Dave showed off the centre's newest loaner telescope. It is a "Canadian Geographic" branded Bushnell 4.5-inch reflector. Those who are familiar with the old AstroScan will recall the design — it looks like a cross between a Newtonian telescope and a bowling ball. It was now time for the handbook talk. Daryl DeWolfe came well prepared; he even had a crossbow armed with suction cup arrows to take care of any hecklers.

He had chosen the limiting magnitude section for his presentation. According to Daryl it is the most important section of the handbook, because minimum visual magnitude (along with seeing and transparency) helps to provide a common basis for comparing observations made by at different times, locations, or between different observers. He showed us how to judge your minimum visual magnitude and that the methods learned can lead to using patterns for star hopping, and being able to measure the brightness of variable stars, comets, and meteors.

Last, but not least, Paul Gray showed us a video of the recent Leonid meteor shower taken with a new DV camcorder, which has a "night" mode allowing it to see faint objects. The battery is good for three hours under normal conditions, and despite the cold weather, it managed to last a full hour. The clarity of the images was most impressive, and the sound track combined the faint noise of the tape motor with the croaking of frogs. ★

Comfort at the Eyepiece

Daryl Dewolfe

Eyepiece selection for your telescope is truly a personal choice. Currently, there is a broad range of eyepiece designs on the astronomical retail market. For observers with telescopes, I have recently checked out an eyepiece that offers some very interesting features.

The Orion 5.2mm LV is an 8-element eyepiece with one of the lenses made of a rare earth glass called lanthanum. Essentially, it appears to be a 6 element, modified plossl design coupled with a 2 element barlow, packaged

into a fine quality housing, with 20mm eye relief. The comfort of the eye relief is both amazing and thoroughly enjoyable to any observer, particularly for planetary observing at higher magnifications. The rubber eyecup can be rolled down easily and completely for eyeglass wearers, retracted halfway for moderate eye relief, or left fully extended for complete light-shielded use. This is a unique feature usually reserved for a few premium eyepieces currently on the market for astronomy.

Images in the eyepiece on a short focal length refractor (T.V. Pronto 70mm f/6.4) were quite good, and very comfortable on the Moon, Jupiter, and Saturn. However, here is the one caveat any observer using a LV eyepiece would have to get used to.

When observing through a "premium eyepiece", observers normally pay more for the crisp, high definition contrast images. LV images are soft in crispness (i.e. the sharpness of the image one sees at the eyepiece). However, the contrast of the image (i.e. how much detail the observer sees in the object they are observing) appears equivalent to any plossl eyepiece I have viewed through. Here's an illustration of what I mean.

Imagine the subtle differences between viewing an equally well lit object on a black velvet surface and then on a black satin surface. On a satin surface the object may appear more vivid & distinct. On the velvet surface the edge crispness of the object appears softer. This is an Orion LV image. The actual

detail of what one sees on the surface of each object is equal. This is the image of a LV eyepiece; perhaps slightly off-colored & not as edge contrasty as a premium plossl or nagler-type eyepiece, but having as much apparent surface detail visible to the eye of the observer. In terms of comfort at the eyepiece (i.e. the ability to relax and enjoy the view) the LV has a huge edge on most competitors. To be able to relax your eye while viewing an object at high magnifications is not just a mere luxury. You will observe

more detail in what you see; as well as enjoy the experience. Orion offers the LV series in 11 sizes, from 2.3mm through 25mm. The apparent FOV is 45 degrees for their top three high power eyepieces, and 50 degrees for the rest of the set. Their LV series is made in Japan and offer full multi-coatings on all air to glass surfaces. Each eyepiece barrel has a captive setscrew recess; a feature usually reserved for premium ocular construction. The Orion LV is available from some reputable Canadian astronomy

suppliers at a moderate cost (approx. \$200 cdn. each). Though this can be nearly double the cost of a quality entry-level plossl, they are less than half the price of most premium super-wide-view eyepieces. If you are considering a one-time investment in lifelong eyepieces that can accommodate your changing vision requirements and offer superior eye comfort, you may want to examine this line of oculars before you commit to spending your hard earned dollars. ★

Book Report

Universe on a T-Shirt – The Quest for the Theory of Everything by Dan Falk

By Paul Heath

Reviewing a book written by a former Centre member can be a tightrope walk, I shall endeavor to be honest and concise.

Dan takes us on a step by step walk through time, starting at the beginning of “scientific thought” and ending up at current “super symmetry and string theories”. He presents us with the developing ideas and discoveries that helped to expand our understanding of the Universe. With the use of quotes from the discoverers and theorists we

get a brief glimpse into how each felt their ideas and discoveries explained the universe around us.

At each step Dan presents a T-shirt that could possibly reflect the understanding of the universe at that step, such as Democritus “It’s All in the Atoms”, Newton’s “three laws of motion and his law of gravity”, to a T-shirt with “general relativity and quantum mechanics” on it. Dan’s T-shirts provide an overview of the understanding of the universe at each step in the journey.

Throughout the book Dan reflects on how each new discovery and theory changes our understanding on how the universe works. Without extensive mathematical use, Dan presents each

new idea in concise and relatively easy to understand language. His chart on pg. 208 nicely outlines the journey for the “Theory of Everything.”

For those that wish to expand on the ideas presented in the book, Dan concludes with a suggested reading list. Although he does not present a final T-shirt, may I recommend “A Ball of String on a Starry Background”.

Overall *Universe on a T-Shirt* is a pleasant read and very informative overview of the journey to find “The Theory of Everything.” Dan’s suggested reading list allows one to look further into any questions that arise on ideas presented in the book. ★

Committee Formed to Run the St. Croix Observatory

by Dave Lane, Observing Chair

At its November meeting, the centre's council chose to create a committee to operate the St. Croix Observatory (SCO). Previously, all of the responsibility (since its construction was completed) for its operation was borne by the Observing Chair. The ultimate responsibility (according to our by-laws) still remains with the Observing chair, so it was thought best for the Observing

Chair to be the chair of the new committee.

The Purpose and Goals of the SCO Committee are:

- a. Development and Implementation of Policies for SCO and its equipment
- b. Operation and Maintenance of SCO
- c. Coordinate fund raising for SCO development
- d. Plan and Coordinate construction of new facilities at SCO

e. Communication of SCO activities to the centre membership

The committee currently consists of myself, Michael Gatto, Paul Gray, Craig Levine, and Gary Weber. Since its formation, the committee has met twice.

We will soon be proposing some new policies and some construction activities to be done this spring/summer. If anyone has any comments or questions about St. Croix, feel free to contact myself or one of the committee members. ★

Nova East 2003 T-shirt Contest

You don't have to be a Picasso or Rembrandt to enter this contest. We're looking for a design idea for this year's Nova East T-shirt. Send us your Star Party T-shirt wearable art idea. If it is selected you will win a free Nova East 2003 T-shirt and be credited with its design. We will accept ideas on biodegradeable materials such as napkins, paper, soup labels, etc. (no wood carvings please!). Or suitable electronic formats such as .JPG, .BMP, .TIF etc. on floppy disk, cdrom, or by email attachments. So send us your pencil scratchings, doodles or electronic creations and we'll see if we can popularize it by having other people wear your art!

It should be obvious that submitted designs have some astronomical reference, so no pictures of favourite relatives or lost pets! We hope everyone has some fun with this contest!

Submit all entries by May 31, 2003 to a Nova East Coordinator or to Darren Talbot via email: darren.talbot@ns.sympatico.ca

Please include your name, phone number, mailing address and email if possible. ☆

Astro Ads

For Sale

10" Home-Made
Dobsonian Telescope

Approx. f/6. Includes 3 eyepieces
and finder scope

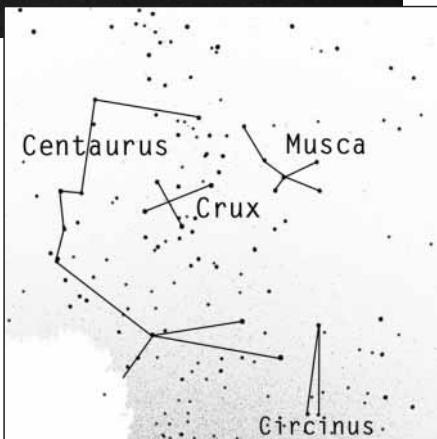
Asking \$750 (negotiable)

Contact: Richard Dawson 883-1557
(Lantz)

Southern Exposure

Dave Chapman submitted this great photo of something we don't see everyday, the southern sky centered on Crux, the Southern Cross. 15s exposure of the star field with a Canon PowerShot G3.

See chart for constellation identification.



Nova Notes accepting commercial ads!

After some serious inquiries the centre executive has approved a proposal to allow commercial advertising in Nova Notes. Three ad sizes are being offered, a 1/6th page (2.5" x 5"), a 1/3rd page (5" X 5") or a 1/2 page (7.5" X 5"). Prices per ad are 25\$, 35\$, or 45\$ per insertion/per issue. Ads will run on a space available policy and inclusion is at the discretion of the editor. Ads should be of an astronomical interest, or at least deemed of strong interest to most of our members. Please contact the editor (*See page 2*) regarding suitable artwork files, to submit artwork or with any questions. ☆

The St. Croix Observatory



The St.Croix observatory. Pictured from left to right, the RASCan, the warm room and the roll-off roof observatory.



The roll-off with the roof partially open.

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 Chairman Dave Lane at 826-7956. *Dates for Members' Nights for the following few months are:*

Fri. Feb. 28th (*Rain date, Sat. March 1st*)

Fri. Mar. 28th (*Rain date, Sat. Mar 29th*)

Directions from Halifax

(from Bayers Road Shopping Centre)

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 can gain access to the St.Croix facility. For more information on becoming a key holder, contact the Observing Chairman Dave Lane at 826-7956.

RULES FOR THE 17.5" SCOPE

On Members' Nights the 17.5" scope must be shared by all members. The 17.5" scope can be used by anyone, but all views have to be shared with anyone interested in taking a look.

On non Members' Nights the scope can be used by individuals wishing to work on personal observing projects. Members should try to limit their use to under 45 minutes when other members are waiting to use it. Preference will be given to members who send an email to the hfxrasc list, or call the observing chair on the night they want to go out. If no one else wants to use the scope then feel free to use it all night, but it would be considerate every so often to ask members there if anyone has been quietly waiting to use it.

Please contact the Observing Chairman Dave Lane for more information or to book the scope at 826-7956.

Meeting Announcements

Halifax Centre of the Royal Astronomical Society of Canada



February 21

"The oldest red giant stars and the formation of the Milky Way"

Dr. C. Ian Short

Assistant Professor

Department of Astronomy & Physics, St. Mary's University

March 21

"Skyways"

Mary Lou Whitehorne

Former Prez Mary Lou can't wait to get up at the podium again to give us a preview of "Skyways. Astronomy Handbook for Teachers."

"Astrophotography"

Shaun Lowe

Some further arm twisting may be necessary, but Shaun Lowe may give also be speaking about his great astrophotography and techniques for successful pictures.



Meetings begin at **8:00 P.M.**

Members of the general public are welcome.

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.

Room 176 Loyola Building

Saint Mary's University (*See Map Below*)

The Halifax RASC

Executive meetings

begin at 7:00 P.M.,

and members are

welcome to attend.



Halifax RASC Executive 2002

Honorary President	Dr. Roy Bishop
President	Steve Tancock
1st vice-president	Pat Kelly
2nd vice-president	Pat d'Entremont
Secretary	Craig Levine
Treasurer	Paul Evans
Nova Notes Editor	Michael Gatto
National Representative	Pat Kelly
Librarian	Dr. Michael Falk
Observing Chairman	Dave Lane
Councilor	Clint Shannon
Councilor	Dave Chapman
Councilor	Andrea Misner

Meeting Location

Meetings are held every third Friday of the month, except for the months of July and August. Meetings take place in room 176, Loyola Building (#3 on map) at Saint Mary's University.

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 Residence
- P = Parking

