NOVA NOTES

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

PRESIDENT'S CORNER: BY CLINT SHANNON

SMU vs Museum

By now many of the members of the Halifax Centre are aware that some discussion has taken place as to whether the Centre should relocate it's meeting location from the Nova Scotia Museum to Saint Mary's University (SMU).

I will endeavor to list the pros and cons that have so far been expressed for your consideration. The advantages to be had at SMU are:

1. Larger capacity meeting rooms are available.
2. The seating is more comfortable than at the Museum.
3. The video projection system is "state of the art".

ASTROPHOTO OF THE MONTH – THE RIGHT STUFF

Mary Lou Whitehorne dressed and prepared for lift off. The photo was taken of Mary Lou at the Houston Space Center in Texas, when she attended a microgravity workshop this past February.

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 **June 18th, 1999**. 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:

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4. The acoustics at SMU are much better than at the Museum.

5. Separate meeting rooms are available for the Council to hold it's meeting. (At times this has been a problem at the Museum).

6. A portable roll-a-way library cabinet would be built by one of our members who is a carpenter of which the only cost would be the materials. (The existing library storage space at the museum is totally inadequate). This portable library cabinet would be stored in the McNally Building and brought to the Sobey/Loyola complex for the regular meetings. It would also probably house some of our supplies for our after meeting Social Hour.

7. The Burke-Gaffney Observatory is close by and could be made available for observing sessions after meetings.

8. There are approximately 400 astronomy students each year at Saint Mary's and with holding our meeting at SMU and with a little on-campus advertising, it would seem entirely possible that we could increase our membership.

The advantages to be had for remaining at the Nova Scotia Museum are:

1. The location is more central.

2. The Museum location is generally known better to the public.

I should point out some of the problems that are encountered at the Museum:

1. The video equipment is not maintained adequately and at times has given us problems.

2. The library storage area is totally inadequate, as previously mentioned.

3. The acoustics leave something to be desired.

4. At times the "south room" is not available for the executive Council meetings even though it has been officially committed for our meetings at the beginning of each year.

5. We are sometimes displaced from the main meeting room at the whim of the Museum. (This could happen at SMU from time to time, however there are several rooms that are large enough for our meetings so it would only entail a room change and not a complete change of venue).

6. Reaching anyone at the Museum on the telephone is practically impossibility and RARELY do they return calls.

7. Access to the Museum for the Council meetings are not possible until 7:00 PM and the meeting moms must be vacated by 11:00 PM, which at times has been somewhat of a problem.

8. As pointed out by Dave Lane, the Museum appears to have no interest in astronomy as a natural science given they're handling of the planetarium (which our members have

been supporting for some 20 years).

It is to be noted, at present, which parking is not a problem at the Museum but it could be a problem in the future as Infirmary parking seems to be creeping in. Parking at SMU is no problem and there is better bus service to SMU stopping on Inglas Street and Tower Road.

Needless to say, a more formal discussion would have to be undertaken with SMU officials before any final decisions and agreements were made and we would need some assurance from SMU in respect of the Halifax Centre's longevity at SMU.
Sometime this coming fall we are planing to hold another regular monthly Centre meeting at the SMU complex in order to give everyone another opportunity to evaluate the facility. A motion would then be entertained at the Annual General Meeting as to whether the Centre should remain at the Museum or relocate to SMU.

We would very much like to hear from the membership expressing their thoughts on this important matter. Ω

APRIL MEETING REPORT: BY LARRY BOGAN

Meeting Report
Friday- April 16, 1999

After some welcoming remarks, President, Shannon, encouraged the membership to remark on the possibility of moving our meeting place to St. Mary's University.

Various members pointed out the following:
- The Halifax RASC has been meeting in the Nova Scotia Museum ever since its renewal in the early 1970's. Recently, however, the advantages of this relationship have been eroded. In the past the museum used to print our newsletter and provide a mailbox for the Society. The meetings have always been on the third Friday of the month. The other days of the month in the schedule for the museum meeting room, are taken by other society meetings. The society has been bumped out of the room on occasions, and have had to seek rooms elsewhere. In addition, although the equipment available is OK for slides, videotape, and overheads, it is aging and there is no facility for computer based presentations. Our Centre library is housed in a cabinet in the museum that is quickly becoming too small. In the past, the Halifax RASC has run the Museums planetarium but provided very little support and as a result, the effort has collapsed.
- The museum is centrally located, well known in Halifax, and has good parking facilities and some members may prefer not to go to another location. However, there are no problems parking at St. Mary's where alternate facilities are available.
- Sponsorship by the St. Mary's Physics and Astronomy Department, could provide the RASC with meeting rooms having modern multi-media equipment. There would also be more room with alternate rooms available per chance one room is not available. Larger storage of our library would be available and our secretary, Steve Tancock, has volunteered to build a mobile book storage and display cabinet for used there.
- One advantage of meeting at St. Mary's is availability of the Burke-Gaffney observatory. We could have observation sessions after meetings and other times.
- One small disadvantage is that, at St. Mary's, no hot drinks could be provided after meetings.

A show of hands of those present indicated that most would be prefer to move our meetings to St. Mary's. There were a few who were not sure and at least a couple who preferred to stay at the Museum. Clint assured everyone that this is an on-going discussion and only after a full membership vote would any decision be taken on this matter. In no way is this meant to be a rejection of the Museum and is only to provide the best meeting facilities for the Halifax RASC.

Roy Bishop reminded the membership of the total solar eclipse on August 11 of this year whose path of totality will be off the coast of Nova Scotia. Roy pointed out that there is a ship cruise available out of New York City that will sail the path of totality to observe the eclipse and then circumnavigate Newfound-land and back to NYC. David Levy is one of the resource persons on the cruise. Anyone interested should contact him. (telephone 902-542-3992 or rbishop@acadiau.ca)

Clint Shannon and Dave Lane are planning to charter an aircraft to flight out over the Atlantic to see the eclipse. There is another

aircraft possibly available for others to charter. Costs are around $300-$400 per person for the flight.

Mike Boschat, our observing chairman, reported To watch for April Fireballs (from investigation by Yugoslavian astronomers).
Lyrid meteor showers (April 22)
Mars at Opposition (April 24)
Occultation of Regulus (April 24)
eta Aquarid meteor shower (May 5). Venus high in west at sunset.
Mars rises at sunset Mike was thanked by a round of applause as Clint announced that Mike would be retiring from his position. Shawn Mitchell will fill in as observing chairman.

Mike Falk, our librarian, presented a new book "Stars and Planets" donated by Mike Bochat.

Clint introduced the speaker for the evening: Blair MacDonald Blair is an active observer and has been a long-time member and VP of the Halifax RASC. He is an engineer trained at UCCB working with Simac Two years ago Blair purchased a Meade CCD camera (Charged Coupled Device) and has learned to image process his pictures. His talk was entitled: "*Less than Technical Aspects of Image Processing*"

Blair used Powerpoint and a data projector to present his talk and examples of his work.

A computer can be used to change the appearance of an image, by mathematically manipulating the image or a collection of similar images.
The image do not have to be from a CCD Camera but can also be from a video camera or a photograph. CCD cameras output images as a digital file. Video images are analog but can be digitized with a frame grabber on a computer and photographs are scanned. All forms involve noise and image signal relative to that noise. The fact that noise is random works in favour of using increased exposure and multiple images for image enhancement.

Noise in a CCD image (dark current, read out electronics, photon statistics, pixel variation, sky noise). Noise in a video image is mostly tape noise. Noise in a photograph is mostly grain.

CCD image processing involves various types of frame subtraction

a) bias frame (pixel variable Sensitivity)
b) dark frame (thermal noise)
c) flat field frame (optical Variation).

There are various mathematical manipulation of the images that are tools for image enhancement.
Manipulate Range of pixel intensity. Two dimensional spatial frequency spectrum and filtering.
Filtering can be done with the mathematical process called Fast Fourier Transform (FFT). There are high and low frequency as well as narrow band of frequency filters. High pass filtering leaves stars and dims diffuse objects and low pass filtering leaves diffuse nebula and lowers noise and star images. Narrow bands can subtract interfering periodic signals. Deconvolution of a signal uses mathematical algorithms which 'unfolds' one type of image from a more complicated image. There are various methods that provide image enhancement for various types of images. Blair illustrate the methods with many different celestial images he obtained with his CCD and telescope.

Darkroom manipulation can in some ways duplicate digital image processing.

During questions, Blair offered estimates on the cost of the equipment needed for image processing as well as the typical software that can do what is needed. Paintshop Pro is Ok for 8 bit image manipulation but a more expensive package such as Maxim DL is needed for 16 bit images. There are math packages such as MathCad and Matlab that include image processing algorithms. There is free software for manipulating FITS format images. He also explained how to mount a video camera to a telescope for eyepiece projection into the camera.

The meeting ended with the usual socializing around refreshments organized by Ralph Fraser. Ω

TWO INTERESTING STARS: BY MIKE BOSCHAT

T Bootis - The Mystery Star – RA 14h 11m, Dec +19d 18'.
It's April 9, 1860 and observer Joseph Baxendell is searching for new variable stars, as he nears Arcturus - Alpha Bootis he sees a "new" star of 9.7 magnitude about 25 arc minutes from Arcturus. The next two nights
he observes the star again at about the same magnitude, as time goes by he watches the star fade to 12.8 on April 22 and by April 23 it was gone beyond the limit of his 13 in reflector. Other observers' looked

in vain for the star with larger telescopes but it was never to be seen again, Modern photographic plates show no star as bright as 17th magnitude near the position.

So, was it a nova? If so the amplitude was in the range of 7 magnitudes an unusually rapid decline of about a magnitude in four days. There is a possibility that the star now called T Bootis may be a recurrent nova and other outbursts may have been missed in the past and up to the present time. This star is still a mystery and the area near Arcturus should be observed by visual, photographic and CCD on every clear night for the elusive T-Bootis and it could be you that makes the discovery.

T Corona Borealis - The Blaze Star - RA 15h 57m Dec +26d 04'

It is May 12, 1866 and the Crown of Corona Borealis has a new star, shining at 2.2 magnitude it attains a maximum magnitude of 2.0 that same night. The star begins to fade rapidly falling below naked-eye visibility in 8 days. By June 7 it has dimmed to its former magnitude. About 100 days after its maximum it brightens to about 8.5 magnitude and remains at this magnitude for 90 days then begins its final decline to its former magnitude. Its called T Corona Borealis.

On February 9, 1946 T Corona Borealis flares up again reaching 3rd magnitude and as in 1866 fades back to its normal magnitude. So, if this is to happen again, taking the 80 year period, the next outburst should occur in 2026 AD or will it be sooner? Here is another star to look out for while observing.

So the next time you are out observing with your telescope, binoculars, for just looking with your eyes take a moment or two and look at these areas. If the Moon is out still make an observation, you could be the one to make a very important discovery. Ω

REFLECTIONS ON A SECOND MESSIER MARATHON: BY LARRY BOGAN

March 17-18, 1999

Every few years the New Moon occurs near March 18 and creates an ideal time to try to see all the Messier catalog of celestial objects in one night. It was exactly eleven years ago (1988) that I tried my first one. That time I practiced the evening objects and was able to find 103 of the 110 objects. I reported in Nova Notes of that year, the immense satisfaction that I had from making the effort and have enthusiastically encourage others to try it ever since.

I anticipated repeating my effort this year and on the 17th was described to my Introductory Astronomy what the marathon entailed. The class ended at 5:30 pm and I quickly checked the weather forecast and discovered that the sky would be clear all night and there did not appear to be another window of opportunity coming up in the near future. So after a quick rush home to set up my 13" Newtonian (dob mount), I madly looked for my old set of astro-cards for the Messier objects. To my relief, they were more-or-less in the order I left them after my 1988 marathon. (later I was to find out a few key ones were missing). During the twilight I ate supper, ripped out the messier list from my 1998 Observer's Handbook, then went out to find the first object, M74. It was a mild evening (+5C) with a light, chilling breeze.

Where was it? Venus and Saturn make fantastic markers for the altitude of M74 and M77 so they should be easy to find! I had forgotten the low surface brightness of the galaxy, M74, and was frustrated by the bright western sky. I knew I was looking directly at it according to my careful, double check, and star hopping but could not see it. I gave up and looked for the galaxy, M77, and what a relief to see it popped right out due to its bright nucleus. When I went back to M74 the sky was darker and I was able to just make it out by moving the field of view around and notice the brighter area where M74 was located. I was glad that the 3/4 hour of looking for the first object was over and the experience helped to soured me on the Marathon.

From there the marathon went smoothly (except that M33 was also much more difficult than anticipated) and I shall not bore you with the details of finding each object. My Nova Notes article in 1988 and some others since can do that. I would rather relate my conclusions on doing the Marathon a second time.

First of all despite the fact that I was using a 13" rather than my 6" used on the first Marathon, I

had a more difficult time finding some objects. The reason: my night skies have brightened in the intervening 11 years. I have a neighbor with a yard light behind the trees to my west and Kentville lights up my east and southeast horizons. Coldbrook, to my south-east, has, in those years, grown car dealers and a commercial strip. As a result I missed the globulars in the base of the teapot of Sagittarius this time. I made a special effort to find M15 and M2 because I missed them in 1988 and was pleased to find M15 without too much trouble before the eastern sky brightened at 5 am. M2 was an extreme frustration because I know I was looking directly at it and could not see it because of the bright sky from Kentville lights.

The above situations are exactly the advantages a computer controlled telescope would have in doing the Marathon. When the sky is bright, it is difficult to find all the stars needed to star-hop to the object of interest. Setting circles (whether mechanical or computerized) would allow one to go directly to the object. quickly and not waste time scanning the sky first with binoculars then with the finder scope before looking through the telescope. (It also removes much of the challenge of the Marathon).

Surprisingly, despite the fact that I was 11 years older, I again observed the whole night without sleep and enjoyed the brightening eastern skies of the morning. I had managed to observe 101 of the objects in the Messier catalog and the ones missed were all morning objects (M54, 55, 69, 70, 75, 2, 72, 73, 30).

I will probably not do the Messier Marathon again. My conclusion after this Marathon, was that although I did enjoy the all-night observing, I would have rather have spent it looking at objects that were not obscured by light pollution and twilight. Why not spent a night looking at your own list of new or favorite objects at high elevation in dark skies. In addition, the Messier list misses large areas of the sky which have interesting objects in them. Also, I had to rush through the many, magnificient objects north of Sagittarius using only binoculars because I knew I had to have time to get the objects farther east before twilight began.

I will admit that the Marathon reintroduced me to some marvelous M-objects that I have neglected recently. Two that come to mind are (1) the open cluster M-46 with its neat little planetary nebula companion and (2) the excellent globular cluster, M-5. I also reveled in jumping through the Virgo collection of galaxies with the use of only a few stars in between. I would remind anyone doing this collection of objects, to have a good atlas of the region. I found the pocket atlas "The Observer's Sky Atlas" by E. Karkoschka (Springer-Verlag) excellent for these galaxies and the globulars in Ophiuchus.

Finally, I would still encourage everyone to try the Messier Marathon at least once. It is an excellent way to get an overall view of the whole sky in one night. Ω

SMU vs NS Museum: By Shawn Mitchell

After the March meeting held at Saint Mary's University an email discussion about pros and cons was held. I have tried to group the questions that were raised with the answers that could be provided so everyone is aware of the concerns about a move and why a move maybe a good idea.

Q. As Roy noted, the audience is "spaced-out" and distant from the speaker and from each other. It is not as "cozy" as the auditorium at the Museum.

Q. How many persons does the room actually accommodate?

A. The room can hold 100 people. Friday night had a lower than normal turn out, only 35 people were there, we typically have 45 to 50 which would have filled half the room. Personally I like a little more room. With good acoustics we don't need to be right on top of the speakers like at the museum.

Q. There seems to be a difficulty with playing videos, a restriction that I did not fully understand.

A. There is no problem with playing videos, we checked and all we have to do
is bring our own VCR (department of Astronomy & Physics) and plug it in.

Q. We would need to investigate how convenient it would be to serve our refreshments. I suspect that--if we asked--permission to bring food and drink in the room would be denied. I suppose we could congregate outside in the entrance hall, but then we would have to guard to goodies. Or we could give

up the refreshments part of the meeting.

A. This is not a problem, students eat there now. The only real change would be the loss of hot water for coffee and tea, but not many partake in this
anyway. Just serve cookies, pop, juice (simplifies the refreshment job). The paper goods could be stored in the same rolling cabinet as the library. Ralph has also stated that very few people actually drink coffee or tea at the meetings.

Q. The location is less central than the Museum. What is the bus service
like?

A. Several bus serve SMU stopping on Inglas street and Tower Road.

Q. There was talk of building a cart for the Library, but I would like to hear more about how this would work. Would someone have to trundle the cart from A to B and back again? Is there nearby storage?

A. Yes. Storge would be in the McNally building ,there is no storage available in Sobeys. Access is through the connecting skywalk and down 1 floor, still reasonably convenient and far more storage room available. We have a cabinetmaker in the centre who has already volunteered to make the roller cabinet. Most of the library would be stored in a cabinet in the departments library and a selection of books would be put on the cart for each meeting and wheeled over (this would be easier than hauling handfuls of books out of the
Cabinet in the museum).

Q. What precisely is the motive to move from the Museum?

A. These are my personal opinions: We have done major amounts of volunteer work for the Museum and are still treated poorly (we get dumped at there convenience, most of the other societies using the museum haven't done anywhere near our amount of volunteer work). The hall is crowded and uncomfortable (the theater seating sucks). The video facilities can't be counted on to work or even to be in the room. Hassles with the security guards (letting us in, chasing us out). Trying to contact anyone at the museum is a waste of time (they are very unprofessional, they don't return calls).

These are a couple of my complaints. The better facilities are a great benefit, however there is another possible benefit to a move to SMU, 400 astronomy students each year. With a little on campus advertising we could
Possibly attract quite a few astronomy students to swell our membership.

I am not against a move, but I think the Centre needs to consider some of the issues above before making a move.

It is interesting to read the comments re: the proposed relocation of the RASC meetings. I confess that I like the Museum location. It keeps the center meetings in the domain of the "general public" as opposed to a university setting. The public knows where the Museum is, as opposed to the Sobey building.

I disagree, the museum has done such a poor job over the last ten years that I think if you asked people on the street where the Museum of Natural History is a significant number would not know. However almost anyone in the city knows where Saint Mary's is located. Granted they probably will not know where the Sobey's Building is but if you say its on Robie street they can't easily miss it.

In using a room at Saint Mary's we would be dependent on certain individuals at that institution having a strong connection to the Centre. Certainly, we have that at present but we have not always had that in the past and I think it would be foolish to rely upon it continuing into the future. People come and people go, but the Centre goes on ...

At first this would be true, however if the Centre interacts with the Astronomy department by possibly providing volunteers for the public observatory tours and any other volunteer services that come up. Then the Astronomy department may start to rely on the Centre for some services thus ensuring a prosperous future cooperating together.

These are some of the concerns and comments regarding a change in meeting location. If you have other comments that have not been stated please let the executive know. Ω

WHAT'S UP:
BY MIKE BOSCHAT

May

Sat.1 Mars nearest Earth at 0.5 Astronomical Units.
Wed.5 Eta Aquarid Meteor Shower peaks at 7am. About 30-40 per hour.
Sat.22 - Regulus occultated: Disappearance dark limb at 1:13 am Reappearance not seen, occurs after moonset.

NOTICE OF MEETINGS AND EVENTS

REGULAR MEETINGS

Date: **Regular Meeting — Friday, May 21 at 8pm**; 7pm for the council meeting.

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

Topic: **Main Speaker**: Mary Lou Whitehorne
Microvariability and Oscillations of Stars

Date: **Regular Meeting — Friday, June 18 at 8pm**; 7pm for the council meeting.

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

Topic: **Main Speaker**: TO BE ANNOUNCED.

BECOME A ST. CROIX OBSERVATORY KEY HOLDER

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

JUST WHERE IS THE ST. CROIX OBSERVATORY?

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

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

June

Fri. 11 Venus at Greatest Elongation East (45 degrees)

Mon .21 Summer begins at 4:49 pm

Mon. 28 Mercury at Greatest Elongation East (26 degrees)

Planet Roundup

Mercury Not visible.

Venus 35 degrees above west horizon at sunset, sets 3 1/2 hours after sunset.

Mars Sets in west during morning twilight.

Jupiter In east by dawn twilight 2nd half of month.

Saturn Better seen in 2nd half of the month in the eastern sky.

New Comet Notice

A new comet was discovered last week by an Australian astronomer. The Comet is C/1999 H1 (Lee) and will be visable to us in late June and early July. The estimated magnitude of Lee in early July is 6.8 a binocular object. Here are the orbital elements for ECU ; Perihelion date 1999, July 11.1735, Q = 0.708563, e = 1.0, Peri = 40.6354, Node = 162.6176, inclination = 149.3602. Ω

1999 HALIFAX CENTRE EXECUTIVE

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