NOVA NOTES

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

PRESIDENT'S REPORT:

BY DAVID CHAPMAN

In the middle of last month I agreed to lead a Parks & Recreation observing session for beginners on learning the constellations and elementary astronomy. The keeners among you would have immediately pointed out that the Moon was full, a traditional "non-observing" time of month. However, this worked out pretty well, as we met at Laurie Park, and I think the group would have been uncomfortable stumbling around in the pitch blackness of a moon-less night.

These activities are actually quite easy to do, as most people have a limited knowledge of astronomy and are usually more than pleased with the most basic facts. For example: that the Big Dipper never sets at our latitude; how to find Polaris, that the stars circle Polaris once per day; and so on. The Moon, Jupiter, and Saturn provided the opportunity to introduce the ecliptic (although I must admit that the dimmer constellations were pretty much washed out). The finale was close-up views of Jupiter, the Moon, and Saturn. This never fails to please, and my newly-acquired Tele-Vue Ranger served me well. (Another reason I was glad of the Moonlight: I didn't want anyone tripping over the most expensive piece of glassware I own!) Unfortunately, the turn-out was small, but I am expecting a donation cheque for the Centre from the municipality.

This month (November) is our Annual General Meeting, which we keep mercifully brief. Nominations closed for next year's executive, and we must have put together a pretty good team, as no positions were contested. I would like to thank Dave Lane and Mary Lou Whitehorne for assisting in the arm-twisting ... er, nomination committee. Here is your 1998 Executive, all acclaimed:

Hon. President	Dr. Cunningham
President:	Clint Shannon
1st V.P.	Pat Kelly
2nd V.P.	Darren Talbot
Secretary	Mary Fraser
Treasurer	Dave Lane
Nova Notes Editor	Shawn Mitchell
National Representative	Dave Lane
Library	Greg Spearns
Observing Chair	Mike Boschat
Councillors	Tony Jones, Steve Carrigan, Dave Chapman

You will notice some familiar names in new places, but also several new names. Darren Talbot and Tony Jones have been quite involved in the St. Croix Observatory project and with observing sessions. (Darren's Hale-Bopp photo is also becoming quite famous.) Mary Fraser might be better known to some as the wife of Nat Cohen, who sadly departed us last year; Mary has maintained her interest in the Centre and we are very pleased to have her on board. Steve Carrigan transferred to the Halifax Centre from Ontario last year and his been a regular at our meetings. Mike Boschat has been active in astronomy in Halifax for some time, and his name might be familiar to astronomically-inclined internet-surfers. He will be taking over the "traditional" duties of Observing Chair, while Shawn Mitchell will continue to Chair the Observatory Commitee, as that project is still far from complete. Paul Gray will continue to coordinate Nova East on behalf of the Centre. No doubt you will be hearing more from and about these people as 1998 progresses. You will notice that I managed to demote myself right some good; but I assure you I will remain involved in the Centre. In particular, I will be assisting Shawn in the proofreading of Nova Notes. Oh yes, Ralph Fraser has agreed to continue arranging the refreshments for meetings. Thanks Ralph!

Following the AGM, Mary Lou Whitehorne will tell us about some of the astronomy education projects she has developed. This would probably also serve as a good "beginner's" talk for our own members.

December's meeting is on the **SECOND Friday of the month**, December 12. The speaker will be George Fowler, who has an interesting yarn to tell. He has been re-reading Homer's Odyssey with a new interpretation: What if this legend of Ulysses' 10-year voyage following the fall of Troy were based on fact and what if this voyage were not confined to the Mediterranean Sea, but was a trans-Atlantic voyage?

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 **December 15th, 1997**. 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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He presented parts of this material at the recent *Oceans '97* conference here in Halifax and I was fascinated. He has carefully researched many scientific and engineering aspects of his hypothesis, including some items of interest to *RASC Halifax Centre*. The very large tides in the Bay of Fundy are driven by the Moon's gravitational effect, and the currents associated with these tides play a large part in George's story. Also, there is a celestial navigation component to the tale, for which George consulted the human ECU himself: Dave Lane. If you are prepared to open your minds for an hour and speculate along with George Fowler, I promise you an entertaining evening of science-flavoured Greek legend. This will be the first time that George will have presented this material in full form anywhere. He is also looking for some new insights from us. See you there! Ω

OBITUARY: ALEX NORMAN

One of our senior Life Members, Alex Norman of Dartmouth, passed away on 1997 October 10. Alex was born in Pennsylvania to Canadian parents, but lived many years in Sydney and Tatamagouche. He was an electronic technician and served in the air force. After that he earned a B. Ed. from the University of Moncton and taught vocational school for many years. Another of his interests was old-time fiddling. Members may remember him from observing sessions at Beaverbank and at some of the annual dinners (when we used to have them!). Thanks to Ralph Fraser for attending Alex's funeral both as a long-time friend and as a representative of the RASC Halifax Centre. Ω

TRANSIENT LUNAR PHENOMENA:

BY MICHAEL BOSCHAT

Some amateur astronomers today look at the Moon as a hindrance to deep-sky observing, and now that the US and Soviet space probes have been there plus humans, the Moon is regarded as a quick look object then off to something else.

Well, the Moon is far from dull and a hindrance to observations. For the amateur can still play a role in lunar observing by watching for the elusive Transient Lunar Phenomena or TLP's for short — a term coined by the great British amateur/author Patrick Moore.

What are TLPs ? As far as scientists are aware they are probably out-gassings of carbon.

During the 1950's and up to 1970's amateurs were observing the Moon for TLP's with the British leading the way in this field. More TLPs were seen and verified by professional astronomers. One US group of professionals at Lowell Observatory observed a reddish glow in Aristarchus in 1963.

But the most notable observation occurred in November of 1958 when the Soviet astronomer Nikoli Kozyrev, using the 50-inch telescope at the Crimean Astrophysical Observatory, noticed a reddish glow near the peak of the crater Alphonsus, and he secured a spectra of the glow which determined it to be a carbon emission.

Later on in the Apollo manned lunar missions they detected mascons (regions of higher mass concentration in certain areas of the Moon) and some were near TLP areas.

How does the average amateur make observations and what lunar areas are to be watched? Noted TLP areas are watched every night with two filters, a red and a blue on a rotating wheel over the eyepiece, any TLP present will "blink" as a dark area. There have been exceptions where no filters were used to see TLPs, so the observer may try that. One main requirement is the telescope size — it is recommended that the most useful telescope size is 8-inches (200mm) and up in a reflecting type telescope. This is because the light is not affected as much by chromatic aberration — color fringes around bright objects.

But, it may be possible for an experienced amateur with a well made 4-inch (100mm) Flourite refractor to make TLP observations. High power should be used, but depending upon the atmospheric conditions, a medium power may be better.

A good time to observe this phenomenon is during a Lunar Eclipse when the lunar surface temperature drops and there is a good possibility of a TLP occurring. The majority of TLPs have also been observed during lunar perigee, when the Earth's gravitational pull has a large effect on the Moon.

Once the amateur notices an event, the time in Universal Time (UT) should be noted as well as the lunar feature. The next step is to notify another observer for verification of the

event and if possible to take a photograph of the area during and after the event with both red and blue filters. The reports can be sent to the Lunar Section of the British Astronomical Association and/or to the Lunar Section of the Association of Lunar and Planetary Observers in the US.

What lunar areas are to be watched? Using a Moon map (one is included in the RASC "Observer's Handbook") observe the following areas;

Mare Crisium	sometimes smaller caters are not seen on floor.
Endymion	floor changes hue during lunar cycle.
Atlas and Hercules	floors sometimes obscured.
Posidonius	reddish glows and odd hazes noted.
Cassini	odd reddish glows seen.
Tycho	reddish glows seen.
Alphonsus	reddish glows and haze noted on it's floor
Ptolemaeus	floor sometimes obscured.
Gassendi	more TLP's seen here than anywhere else.
Eratosthenes	odd floor hazes.
Shickard	floor changes hue at times.
Copernicus	odd floor obscurations.
Archimedes	floor markings change.
Aristarchus & Schroter Valley	many TLP's noted here, a nice priority area to monitor, even during Earthshine and eclipses.
Plato	craters on floor not seen at certain times.

Hopefully fellow amateurs will make observations of the above areas and thus show that the Moon is not a dead world after all, but worth observing. Ω

MEETING REPORT: SEPT 97

BY ANNA MYERS AND MARY LOU WHITEHORNE

President Dave opened the meeting by welcoming everyone to the first meeting of the new school year. (He did this at 8:03 PM - just a tad late! He must be slowing down as his term at the helm is soon to expire...)

He reviewed for us the summer activities: Nova East '97, board walk astronomy in Halifax, and the opening of the observatory in St. Croix. He encouraged folks to join the centre — perks include the Handbook, Nova Notes, the Journal, SkyNews, lists of members, lending library, telescopes for loan, access to our observatory, and free cookies at our regular meetings.

2nd VP, Clint Shannon, tempted us with beautiful pictures of Comet Hale-Bopp for sale, as well as the 1998 RASC calendars ($12 each). Proceeds go to support Centre activities such as observatory and the like. The writers among us were pleaded for articles for Nova Notes! Here's your chance to launch a new career as an award-winning author — don't miss it! There is only one more issue left from which to decide the prestigious Burke-Gaffney Award.

Thanks were expressed to member Mike Boschat who donated several books, charts, and two fine telescopes to the Centre. Much appreciated!

Mary Lou Whitehorne shared her June 21st slides which celebrated Solar Noon on the Summer Solstice and the grand opening of the St. Croix Observatory — a starry Nova Scotia summer began! Hard work and dedication brought that special celebration to its height.

Shawn Mitchell announced a few work parties would be coming up to put the finishing touches to the St. Croix site. His "What's Up" feature summarized happenings in the sky along with the best windows for observing the Russian space station Mir from Halifax.

Dave Chapman then announced that the October meeting would be a member's night where we would like to have 5 or 6 members present "short snapper" talks on any aspect of astronomy. Step right up, folks, and volunteer to share your astronomical experiences with the rest of the group!

The main talk, presented by Roy Bishop and Pat Kelly, entitled "History of the Cosmos" challenged and entranced us! Roy took us back to the Big Bang and challenged our brain cells with some convincing math. Anyone who tried to doze was zapped by a primordial neutrino! Presenting as background information the relationships between temperature and wavelength and energy (joules and electron volts got dragged in) Roy explained the interchange between matter and energy in the very early Universe. A most remarkable feat it was, because he made it quite understandable! He highlighted the significance of the 700,000 year mark — prior to this time the Universe had been opaque rather than transparent, as it is today. We gained a new respect for those bananas that we eat — they being full of 40K potassium from a long time ago.

Pat Kelly took it from the 700,000 year mark up to the present with his "Timeline of Cosmology." He took us through the Geocentric, Heliocentric, and Island Universe cosmologies to the Galactocentric and finally to the modern cosmology that interests us today. Pat's talk had considerable gusto and dizzied us a bit, but we made it through all the phases quite intact!

If you didn't understand everything, don't worry, even Einstein made mistakes!

Following the above-described treat-of-the-month, President Chapman took the floor yet again to ask Roy to help out with one final item of business.

Why? you ask. Roy was appropriately presented with the Burke-Gaffney Award for his Nova Notes article entitled "Six Bright Comets" — well deserved praise from the entire group.

All headed with escape velocity for the cookies and conversation, bringing the last summer meeting of 1997 to a pleasant close. Ω

NEWS BULLETIN:
DATELINE, ST. CROIX, NS

One night last month, members of the radical fringe observers group MAG invaded and occupied a local RASC observatory HQ. No prisoners were taken. As to the reason for this unauthorized occupation, MAG comments "because it was unoccupied, and the skies were clear". Various acts of mischief and sabotage were conducted. MAG members admit to uncapping RASC club telescopes and filling them with photons. MAG commented that these spontaneous occupations may continue in the future at any time. MAG's political wing actively supports vicarious viewing of the night sky through other peoples telescopes.

- Mr. MAK-NEWT
(Minas Astronomy Group)

NEWS RELEASE:
ASTEROID NAMED FOR NOVA SCOTIAN ASTRONOMER, ROY BISHOP

Amateur astronomer and retired professor Roy L. Bishop, of Avonport, Nova Scotia has been honoured by the International Astronomical Union by having an asteroid named after him. Previously designated only by its number, minor planet 6901 now has the additional name Roybishop.

Roy Bishop is an active amateur astronomer, spending many nights in the observatory attached to his home, and is highly regarded for his ability to communicate astronomy and physics to the general public. He was a physics professor and department chair at Acadia University in Wolfville, NS. Since 1982 he has edited the Observer's Handbook of the Royal Astronomical Society of Canada, an annual publication of vital importance to professional and amateur astronomers. He is also known for his unique photographs of celestial and atmospheric phenomena, especially one of a double rainbow in the sky above the birthplace of Sir Isaac Newton, near Cambridge, England.

Roybishop is one of around 8000 minor planets that orbit the Sun, mostly in the gap between the orbit of Mars and the orbit of Jupiter. They are small, irregular, rocky bodies ranging in size from one to several hundred kilometres across. Roybishop is in the constellation Scutum at the moment, but is a dim object, beyond the range of small telescopes. The team of Carolyn and Eugene Shoemaker discovered the asteroid photographically on 1989 August 2 at Mount Palomar Observatory, California. The suggestion for the honour was made by the Shoemakers and Wendee and David Levy, all of whom recently visited Nova Scotia. Ω

STARLAB NEWS:
BY MARY LOU WHITEHORNE,
STARLAB COORDINATOR,
THE ATLANTIC SPACE SCIENCES FOUNDATION

The Atlantic Space Sciences Foundation's new Starlab portable planetarium program has been very active since the Starlab arrived in Nova Scotia. The Starlab, also known as the "Space Bubble" or the "Inflatable Universe," made its public debut on March 17, 1996 at the Halifax Shopping Centre where short planetarium shows were presented for free all day to over 400 people. Since then it has travelled to many schools, been the centerpiece of a number of teacher workshops, appeared on ASN's Breakfast Television, and has been the focus of a lot of fun, excitement and learning for many, many Nova Scotians.

In the Spring of 1996, Starlab travelled to eight schools under a special introductory program, where a planetarium operator (Shawn Mitchell) went with the Starlab and presented educational programming to the students. Everywhere it went it got rave reviews.

Each teacher workshop brings more Starlab teachers on line and further increases the demand for Starlab. Teachers immediately recognize the potential for learning that Starlab represents, and as soon as they have it in their school for a day or two they are devising their own individual programs and finding more and more ways to incorporate Starlab into all areas of the curriculum at all grade levels. These teachers are scientists at heart - they all seem to love to experiment with it!

With September came the beginning of a new school year and the start of the Starlab program as originally intended. Our freshly minted Starlab teachers began booking the Starlab for their schools a week at a time, and Starlab began its travels across Nova Scotia. In the first year of operation some 10,000 students have enjoyed the Starlab experience and six Starlab teacher workshops have been held and more are scheduled. As of this writing, Starlab is booked for all the remaining slots in the 97/98 school year, two more teacher workshops are filling up, and the calls just keep coming in.

Everybody is having fun with the Starlab. Teachers love it and their students are unabashed fans of Starlab — they go crazy with excitement when Starlab comes to their school. One school managed to get 900 kids through it in one week! Several schools have had "Parents' Night" or "Community Night" and invited parents and community groups in for an evening to enjoy Starlab. Still other schools have used Starlab as the focus for "Space Week" or "Space Month" where it has served as the centerpiece for a wide range of activities and studies in astronomy and space sciences.

This kind of response to the Starlab is very rewarding for the participants, but even more rewarding for The Atlantic Space Sciences Foundation to see our facility being put to such active and fruitful use in Nova Scotia. This was what we had intended all along. It is extremely gratifying to see our dream come alive in the enthusiasm and excitement of young Nova Scotians as they embark on their journey into the future.

Maybe one Starlab just isn't enough for Nova Scotia! Ω

(The Atlantic Space Sciences Foundation is a charitable foundation whose seeds originated out of a planetarium committee of the Halifax

Centre. It primary long term goal is to realize a major planetarium facility in the Halifax area.)

MARS PATHFINDER WINDS DOWN: BY NASA JPL (EDITED)

After operating on the surface of Mars three times longer than expected and returning a tremendous amount of new information about the red planet, NASA's Mars Pathfinder mission is winding down.

With depletion of the spacecraft's main battery and no success in contacting Mars Pathfinder via its main or secondary transmitters, the flight team cannot command the spacecraft. "We concede that the likelihood of hearing from the spacecraft again diminishes with each day," said Pathfinder Project Manager Brian Muirhead.

At the time the last telemetry from the spacecraft was received, Pathfinder's lander had operated nearly three times its design lifetime of 30 days, and the Sojourner rover operated 12 times its design lifetime of seven days.

Since its landing on July 4, 1997, Mars Pathfinder has returned 2.6 billion bits of information, including more than 16,000 images from the lander and 550 images from the rover, as well as more than 15 chemical analyses of rocks and extensive data on winds and other weather factors. The only remaining objective was to complete the high-resolution 360-degree image of the landing site called the "Super Pan," of which 83 percent has already been received and is being processed.

The Mars Pathfinder team first began having communications problems with the spacecraft on Saturday, Sept. 27. After three days of attempting to reestablish contact, they were able to lock on to a carrier signal from the spacecraft's auxiliary transmitter on Oct. 1, which meant that the spacecraft was still operational. They locked on to the same carrier signal again on Oct. 6, but were not able to acquire data on the condition of the lander.

Over the last month the operations team has been working through all credible problem scenarios and taking a variety of actions to try to recover the link with Pathfinder. With all of the most plausible possibilities exhausted, the team plans to continue sending commands and listening for a spacecraft signal on a less frequent basis.

After that, the lander would begin getting colder at night and go through much deeper day-night thermal cycles. Eventually, the cold or the cycling would probably render the lander inoperable. According to Muirhead, it appears that this sequence of events has probably taken place. The health and status of the rover is also unknown, but since initiating its onboard backup operations plan a month ago, the rover is probably circling the vicinity of the lander, attempting to communicate with it.

The rover, which went into a contingency mode on Oct. 6, or Sol 92 of the mission, had completed an alpha proton X-ray spectrometer study of a rock nicknamed Chimp, to the left of the Rock Garden, when it was last heard from. The rover team had planned to send the rover on its longest journey yet — a 50-meter clockwise stroll around the lander — to perform a series of technology experiments and hazard avoidance exercises when the communications outage occurred. That excursion was never initiated.

Part of NASA's Discovery program of low-cost planetary missions, the spacecraft used an innovative method of directly entering the Martian atmosphere. Assisted by an 11-meter-diameter parachute, the spacecraft descended to the surface of Mars on July 4 and landed, using airbags to cushion the impact. The spacecraft's novel entry was successful.

The scientific highlights of the Mars Pathfinder mission are:

* Martian dust includes magnetic, composite particles, with a mean size of one micron.
* Rock chemistry at the landing site may be different from Martian meteorites found on Earth, and could be of basaltic andesite composition.
* The soil chemistry of Ares Vallis appears to be similar to that of the Viking 1 and 2 landing sites.
* The observed atmospheric clarity is higher than was expected from Earth-based microwave measurements and Hubble Telescope observations.
* Dust is confirmed as the dominant absorber of solar radiation in Mars' atmosphere.
* Frequent "dust devils" were found with an unmistakable temperature, wind and pressure signature, and morning turbulence; at least one may have contained dust, suggesting that these gusts are a mechanism for mixing dust into the atmosphere.
* Evidence of wind abrasion of rocks and dune-shaped deposits was found, indicating the presence of sand.
* Morning atmospheric obscurations are due to clouds, not ground fog; Viking could not distinguish between these two possibilities.
* The weather was similar to the weather encountered by Viking 1; there were rapid pressure and temperature variations, downslope winds at night and light winds in general. Temperatures were about 10 degrees warmer than those measured by Viking 1.
* Diversity of variations in the brightness of the Martian surface, was similar to other observations, but there was no evidence for the types of crystalline hematite or pyroxene absorption features detected in other locations on Mars.
* The atmospheric experiment package recorded a temperature profile different than expected from microwave measurements and Hubble observations.
* Rock size distribution was consistent with a flood-related deposit.
* The moment of inertia of Mars was refined to a corresponding core radius of between 1,300 kilometers and 2,000 kilometers.
* The possible identification of rounded pebbles and cobbles on the ground, and sockets and pebbles in some rocks, suggests conglomerates that formed in running water, during a warmer past in which liquid water was stable. Ω

NOTICE OF MEETINGS AND EVENTS

REGULAR MEETINGS

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

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

Topic: **Main Speaker**: Mary Lou Whitehorne. Topic: **"Playground Planets - Astronomy for Grades 1 - 3."** The business associated with the centre's annual meeting will also be conducted (which is promised to be short!).

Date: **Regular Meeting — Friday, December 12 at 8pm**; 7pm for the council meeting. **Note that this is the second Friday!**

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

Topic: **Main Speaker:** George Fowler. Topic: **"Tales of Brave Ulysses."** Was he swept across the Atlantic into the maelstrom in Minas Basin and did he navigate his way home by the stars?

1998 OBSERVER'S CALENDARS FOR SALE

1998 Calendar's are available for sale. You can purchase them at either the November or December meeting or by calling Clint Shannon at: 889-2426

COMET HALE-BOPP ENLARGEMENTS STILL AVAILABLE

Enlargements of Comet-Hale Bopp are still available for sale. Remember, they make great inexpensive Christmas gifts! 8"x10" sizes are $5. In-stock larger sizes may be available at the November meeting at very attractive prices.

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 operations can gain access to the centre's new Observatory, which is nearing completion. To become a key holder, contact the Observing 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.*

ASTRO ADS

Celestron C-6 Telescope

6" f5 Newtonian telescope with very solid equatorial mount, motor drive (ra only), 26mm Celestron Plossl ep, 15mm Tele-Vue wide field ep, and 3x barlow
Asking **$700** Call: 826-1396
Robin Murray (St. Margaret's Bay)

Meade 11x80 Giant Binoculars

Asking Price: **$400**
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1997 HALIFAX CENTRE EXECUTIVE

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