Nova Notes

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

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In this issue:

Front Page Photo:

"Observe The Moon" photo - Chris Turner Canon T1i through LX200 12" ACF, 1/640 sec, f/10, 800 ISO

From the editor *Quinn Smith*

As I'm sure you all know by now that this year's Nova East Star Party was cancelled due to a hurricane (for the second time in two years!). So much for the weather guarantee I gave for Nova East in the last editorial. All I can do is apologize, promise never to give a meteorological guarantee again, and offer to resign as Nova Notes editor. OK two out of three "aint" bad! - you're probably stuck with me as editor for a bit.

This is the first of the new electronic Nova Notes format. Well actually Nova Notes has been available on line for several years, but this is the first edition that is only being mailed out to those who have requested it, or paid for it during membership renewal. If you have "missed the boat" by not contacting me and asking to continue to receive the mailed newsletter, or have requested same and I have screwed up, (yes it happens!) please contact me via e-mail (novanoteseditor @)rasc.ca).

The NOVA program is a fantastic introduction to astronomy. Sean Dzafovic is running this program again this year starting on Oct 15th (1 hour before the Centre meeting - in the meeting room). Although applications to join closed on Sept 15th—contact Sean (see page 2) in case he can fit you in. This program is highly recommended for newcomers to astronomy.

In closing, I must sadly report on the passing of one of our long time members Ralph Fraser. Ralph will be missed by the many Centre members who knew him. There is a short memorial for Ralph on page 3.

St Croix Observatory

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. Observing nights (Fridays close to the New Moon) are open to members and guests.

If you are not a key holder and would like to become one, or need more information please contact the Observing Chairman, John Liddard (see below).

Upcoming Observing Nights:

October	8th	2010
November	5th	2010
December	3rd	2010

Meetings begin at 8:00 p.m. at Saint Mary's University in room Sobey SB 160

NOVA program begins at 7:00 p.m. in the same room

October 15th 2010 - Speakers night
Dr Roy Bishop will discuss Subrahmanyan Chandrasekhar - astrophysicist (1910 - 1995)

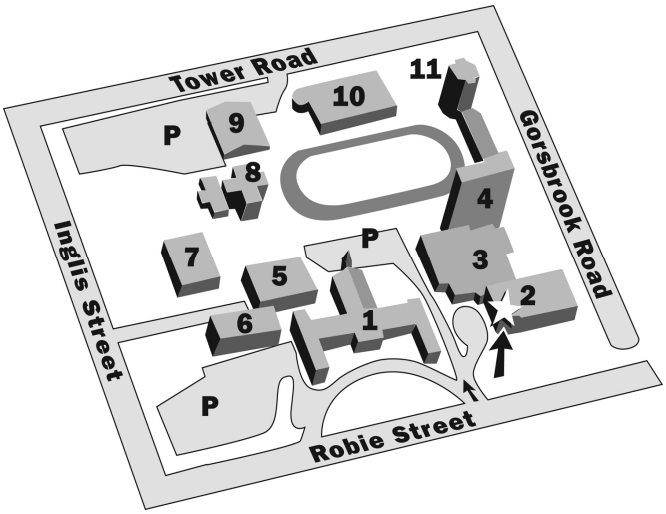
November 19th 2010 - Speakers night
Dave Chapman will describe his astronomy adventures in Cuba.

December 17th 2010 - AGM
The Halifax Centre's Annual General Meeting.
What could be more fun than watching the Halifax Executive make complete fools of themselves?

[The content of all meetings is subject to change]

Meeting Location:
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



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

The Nova program (an introductory course in astronomy) starts 1 hour before the main meeting, in the meeting room.

Executive meetings begin at 7:00 p.m., (usually in room SB159), and all members are welcome to attend.

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Ralph Fraser

Mary Lou Whitehorne

Ralph Fraser, 1918 - 2010

Halifax Centre lost life member Ralph Fraser, who died on August 8, 2010 after a brief illness. He was 92. Ralph was a quiet, devoted member who served the Halifax Centre and the Society well for at least thirty years.

Ralph contributed to the work of the Society and the Halifax Centre in many ways. We especially enjoyed his several-year term as the Centre's unofficial "cookie chairman," as he faithfully brought cookies, cakes, crackers, cheese, tea and coffee to every meeting, and engaged members and visitors in lively conversation.

Over the years he also volunteered at public events, stargazing sessions, and acted as a driver when the Halifax centre hosted the national Society's annual General Assembly in 1993.

We will miss his presence, his generosity and his kind, gentle and good-humored spirit.

Picture taken at the 1993 AGM in Halifax - thanks to Ian Anderson.

The Pelican Nebula photographed and processed by Blair McDonald.

For information on how Blair "squeezes" out so much information from an astro-photograph, follow his article "Imager's Corner" in Nova Notes.

This edition's article can be found on page 6.

HALIFAX CENTRE

Nova Notes: The Newsletter of the Halifax Centre of the RASC

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Nova Notes is published 5 times a year, in February, April, July, October and December.
The deadline for the next edition is November 20th 2010
The opinions expressed herein are not necessarily those of the Halifax Centre.
Articles on any aspect of Astronomy and Allied Sciences will be considered for publication.

Astronomy Outreach in Cuba (part 2)

Dave Chapman

This is a continuation of Dave's account of his outreach visit to Cuba in March 2010. The first installment was printed in the July 2010 edition of Nova Notes.

In Part 1, I described my workshops in Havana with the single Galileoscope I managed to get through Cuban Customs. On our journey to the airport to attempt to liberate the other 12 Galileoscopes, Oscar Alvarez surprised me by asking if I would record a short TV spot on the topic of UFOs and extraterrestrials.

Cuban TV was planning the broadcast of a documentary on the topic, they had lined up several "experts" to comment, and they wanted my perspective. I agreed, and ended up in a cavernous room in their Capitol Building one afternoon to shoot the piece. They asked me to answer the question: "Why do the vast majority of people believe that extraterrestrial beings routinely visit Earth in spacecraft?" I do not have a copy of my answer, but it went something like this:

"This is an interesting question and I thank you for inviting me to comment on it. First, I should say that I am not a specialist in this area of study, so I can only answer in my capacity as an amateur astronomer and as a critical thinker.

Making of the video on UFOs in Havana

I am not convinced that the number of people who believe this assertion constitutes a "vast majority", but I accept that at least a significant minority of people believe in these phenomena, so I will continue on that basis.

To start with, I should say that UFOs are real and dangerous. [Note: I stole this line verbatim from Roy Bishop.] You may be surprised to hear me say this but I shall explain. UFOs are real because in the vast majority of cases, people actually observe or otherwise sense a real experience; we have to assume that people do not simply make these stories up, for the most part. So they see something in the sky that they cannot identify, in other words, an unidentified flying object.

These UFOs are dangerous because many observers do not search for natural or anthropogenic explanations for what they perceive; they immediately jump to the most fanciful or outrageous explanations, such as extraterrestrials visiting Earth in flying saucers. When investigated rationally using critical analysis, time and time again these so-called UFOs have turned out to have simple earthly explanations.

The fact that I am an amateur astronomer is relevant to this question for the following reason: the hundreds of a amateur astronomers I know have spent thousands of hours looking at the sky, and yet not a single object has been sighted whose explanation demanded the involvement of extraterrestrials."

"Now I will try to answer the specific question regarding why people believe in the extraterrestrial origin of UFOs. This is not a question for the physical sciences to resolve; rather it lies in the domain of evolutionary biology, psychology, and neuroscience. The one element that distinguishes humans from all other known life forms is our large brain. The evolution of the brain has allowed humans to imagine realities that do not yet exist. Hence we can develop tools to assist our work, design and build magnificent new buildings, create art works never before seen, compose music never before heard, and to imagine stories of events that never actually happened.

The Havana planetarium, once a cinema

This imaginative capacity of the brain has allowed us to create wonderful things, but it has also left us with a boundary between fantasy and reality that can become blurred. As the scientific investigation of our own minds continues to unfold, we may improve our understanding of these UFO and other irrational beliefs, but there may never come a time when they entirely disappear."

Apparently, this clip appeared at the end of a science documentary on UFOs that appeared on Sunday, April 25, after the news. I have no idea how it was received!

Before I left Havana, I took a group of 10 people (mostly Canadian visitors) to the new Havana Planetarium for a private tour. The nucleus of the building is a brand new optical-mechanical projector supplied by Japan.

The planetarium building is temporarily closed for necessary repairs, but we were still able to tour the facility and to enjoy a brief demonstration of the

The planetarium projector

projector (not a complete show). The views of the heavens projected onto the 10-metre dome were spectacular! The building is a former cinema in Plaza Vieja (Old Square) and is situated a stone's throw from the Havana Taverna, which brews its own beer. (For the duration of our visit, the Havana Taverna became our temporary HQ, much as The Henry House is for our activities in Halifax.)

The Planetarium Director—a lady whose name I forget—invited me back to give my next set of lectures at the planetarium itself!

In conclusion, Plan C (which was not really a plan at all) turned out to be an enjoyable and productive session of astronomy outreach in Havana, with the added benefit of meeting new astronomy friends. With almost a year to plan for a possible next trip, there's no telling what will go wrong! I will keep you posted.

The "Sun" contains the theatre and planetarium projector

September Meeting Report

Chris Young

The meeting was opened by our President Richard Vanderberg and was very well attended.

In total there were 92 people crammed into the room, and chairs had to be added to the aisles. Quite a few people were there just for the presentation including a few children and a number of women. It was nice to see the presentation had attracted a different group of people compared to our regular meeting. I would estimate 35 attended for the presentation only and the remainder made up of the converted (say 45) plus a dozen who were curious about both.

RASC business was brief. Dave Chapman gave an update to the summer outreach events, including the DSP presentation at Keji (see page 9).

Blair discussed the cancelled Nova East Star Party (due to the park being closed because of hurricane Earl). A discussion ensued as to whether to move the date of Nova East from the new Moon nearest the end of August to another time (a month earlier or later). A decision will be made by the NE committee later in the year.

It was then time to introduce our featured presenter Mi'kmaq Elder Murdena Marshall of the Eskasoni First Nation in Cape Breton. She was assisted by Ms Prune Harris.

Elder Marshall is the spiritual leader of the Mi'kmaq people and an authority in traditional Mi'kmaq culture with a long interest in Mi'kmaq astronomy. She provided guidance in the production of the animated video of the traditional story of "Muin and the Seven Bird Hunters" ensuring that the traditional Mi'kmaq understanding of the story was clearly conveyed.

Elder Marshall received her Bachelor of Education from the University of New Brunswick and her Masters in Education from Harvard University. She has worked as an educator in the community prior to joining Cape Breton University where she was instrumental in setting up the Integrative Science Program. In this Program students learn Indigenous and Western sciences side by side. Elder Marshall has retired as an Associate Professor in Mi`kmaq Studies from Cape Breton University. She was assisted by Ms Prune Harris M.A. of the Integrative Science Program of Cape Breton University who is knowledgeable in the Mi'kmaq culture and was involved in the production of the animated story.

Elder Marshall provided background and interpretation of a traditional night sky story of "Muin and the Seven Bird Hunters". This sky story, passed on in the oral tradition of the Mi'kmaq First Nation, links the annual cycle of the seasons with the movement of the stars and the Mi'kmaq constellations. The story carries the information to use the seasonal star positions as a calendar to mark the date of the Mi'kmaq Mid-Winter Feast.

The presentation included a showing of the animated audio/video production of "Muin and the Seven Bird Hunters". This video presentation was first shown at the Canada Science and Technology Museum in Ottawa as part of the start up of the 2009 IYA celebrations. The story provided insight and appreciation of the Mi'kmaq view and understanding of the earth and sky as well as a valuable and memorable lesson of the relationship of the earth's seasons and night sky star patterns.

The presentation was very well received by all those present and there was a good discussion afterwards. All in all, a fantastic and interesting evening.

The RASC Halifax Centre would like to thank the RASC National for their financial assistance in bringing these presenters to Halifax for this wonderful evening of Mi'kmaq astronomy, culture and tradition.

This edition's question centers on how much processing is applied to astrophotos and is it based in science or art. Where do you guys come up with these? (Keep them coming!)

The answer the first part of the question is simple – **lots**! There is much more time spent at the computer than there is at the guiding eyepiece (anyone remember what one of those looks like?). Once you figure out the quirks of your imaging system and master polar alignment, setup takes about half an hour and alignment about another 20 or 30 minutes. Focusing takes about five minutes and you're in business.

If you are guiding then setting that up can take another 20 minutes, but it is well worth it. From there on in the equipment does the work and you can enjoy the view of a star filled sky through other telescopes, binoculars or even with the unaided eye.

The processing is another story altogether. The usual calibrating, stacking and producing the image ready for post processing is pretty standard stuff and there are several packages that automate the whole process. If you stop there the results are rather disappointing. Here is a stacked and calibrated 30 minute image of NGC 7000 (the North American Nebula) as an example.

It rather boring and the nebula is just barely there! After about two hours of setup and exposure the result leaves you a little flat. But this is where the fun starts. After many hours (about 10 in all) of trying different techniques to squeeze out as much detail as I could, I ended up with what I consider an acceptable image.

So if you have just taken your first astro-image and are disappointed with the result, have some patience and some coffee, roll up your sleeves and start processing! Plan on spending three to five times the time spent acquiring the image in the processing. There will be lots of false starts, but after a while you will develop a workflow and use many of the same processes over and over again. At that point the processing will get shorter, but still take longer than acquiring the data in the first place.

Now for the second part of the question, is it science or art? The answer here is a bit of both. The foundations of image processing and astrophoto processing in particular are rooted in signal processing. All the same processes that I use in my day job to design software radios and tracking systems are generalized to two dimensions and used in image processing. Those nifty kernel filters that are available in almost every image processor are just 2D implementations of a FIR (finite impulse response) filter common in all signal processing. Much of the image calibration and stacking relies on well developed signal processing techniques and engineering knowledge of the sensors used.

Many amateurs do solid scientific work and limit their processing to that which preserves the integrity of the data for things like photometry. Personally I capture and process images with the end goal of making a pretty picture. That means that I will take liberties with the data to get the final effect that I want. If there is noise in one area then I'll use a layer mask and turn up the filtering on just that area. Or if something I want in the image is dim, I'll stretch the brightness more in that area than others. Take the following Horse Head shot as an example.

If I had simply applied linear processing, the bright stars would so overwhelm the image that it would be a very boring shot. Instead, several stretches were used with mask layers to block out the brighter areas. Is it what it looks like in reality – **absolutely not**, but this is one area where reality should imitate art!

The real view makes for a terrible shot that I would not even put in my digital picture frame let alone on my wall. Colourless, dim nebulae and overly bright stars are not what I was after in the processing so that is where the art comes in, bringing out the parts that you want to see and suppressing sections of the image that are not so interesting.

Chasing a fiscal "ghost"

Ian Anderson

Tracing the Mysterious $452.54 "Miscellaneous Assets" on the Halifax Centre Balance Sheet

This article, prepared at the end of the Centre's 40th year of resurrection takes a brief look at one small aspect of our past, and has been offered to Nova Notes as an item of general interest. It would otherwise appear as an addendum to a bloated treasurer's report currently in the making.

The Halifax Centre RASC re-opened for operations in September 1970 after a dormancy of several years in the late 1960s. The Centre's first opening dates back to 1955, but the details of that period are unknown to me.

The first asset category mentioned in the earliest treasurers' reports "post resurrection" was cash. The fiscal 1972 report mentioned the Centre cash balance of $85.50. I found no records going back before this.

Understandably, the young Centre was concerned with its cash balance which jumped to the middle hundreds by mid decade. Cash stood alone as the sole asset category through 1979.

In 1980, under treasurer Sherman Williams, about $1,000 of library books was informally acknowledged which doubled the Centre's total worth to over $2,000. That first valuation of books, exists as a portion of our current library value, un-depreciated to this day. At the time however, no representation of a balance sheet of assets and equity was adopted or carried forward.

Then in 1983, with Randall Brooks as treasurer, the Centre began to account for the possession of a number of items which might be described as Observatory Equipment, but were categorized under the heading "Other Assets" of $2,370. They included library holdings, but also, unsold handbooks, the mirror grinding apparatus and other mirror kits and accessories, as well as RASC crests and pins.

In an attempt to present the Centre's financial standings comprehensively, Joe Yurchesyn was the first in 1987 to establish a formal balance sheet approach which has been used ever since. He added three more categories to the asset rostrum: including Accounts Receivable, Merchandise Inventory, and Observatory Equipment. Joe broke up a $3000 estimate of non-cash "other assets" into its components. Chief among them was a $1200 C8 telescope we purchased in 1985 as observatory equipment. What he felt "Miscellaneous Assets" should include is difficult to determine, as it was set at a nominal value of $100.

The mirror grinding apparatus, recovered this year from the bowels of SMU by Dave Lane, was either donated to us from time immemorial, or record of its purchase is long lost. There are surviving members from those days who have vague recollections. Misc. Assets through the late 1980s stood at $100. I could not find any list describing what they were.

Nat Cohen accounted for two purchases in his second year as treasurer in 1990. Added to Misc. Assets were "slides" and "film", valued at $112.90 and $14.95 respectively. He probably felt sundry office items like staplers and hole punches had a real-world value of $21.15 which neatly rounded "Misc. Assets" to $250.00 which was the category's worth when the position of treasurer was handed over to me in 1992 on my first run at it.

A slide projector was either purchased in those years by the Centre, or given to us. I have never found a record of its purchase, unless Nat meant "slide projector" in the $112.90 item above.

In 1994, we spent $148.46 on a "Slide Copier" and another $54.08 on "Slides" - long forgotten by most of us. So in that year, Miscellaneous Assets grew to $452.54 where as a dormant asset category it has languished ever since.

I am curious how many of these items exist today, or whether their whereabouts is known. I also wonder if this asset category's realistic valuation should be cut by half.

Experimenting with Imaging

Pat d'Entremont

On September 5, a group of us decided to lick our Hurricane Earl wounds by gathering at St. Croix for what would have been our last night of observing at Nova East. We had a really good crowd of over a dozen people. The sky was clear and reasonably transparent.

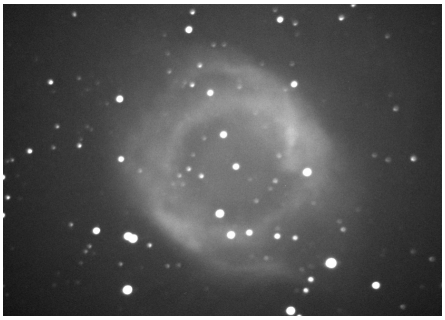
I took a few images with my Meade gear, a DCI 3 camera on an 8-inch LX -90, and played around with focal reducers. I find I am learning with each session and thought I'd share some of my experiences with the group.

(I also tried out my portable power supply system since I had it prepared for Nova East. It consists of a 400W power inverter connected to my van's battery to keep the laptop fully charged, as well as a 12V power pack to drive the scope. I had both these running for 6 hours with plenty of juice left when I packed up.)

The first three images are of the Helix Nebula, a planetary nebula in Aquarius and is the closest planetary to us therefore appears large and diffuse. The first two images are taken with a f/3.3 focal reducer and the third one with a f/6.3 reducer. The purpose of a focal reducer is to reduce the focal ratio of your telescope, which means faster imaging and a wider field of view. It effectively reduces the magnification.

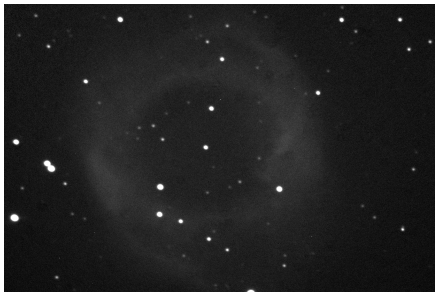
After taking the first image, I had to really boost the contrast to get rid of noise and vignetting. (I didn't take any flat frames & wouldn't know what to do with them anyway, but darks are subtracted.)

The second image is the same image in fact, only this time I am trying to get rid of vignetting by simply cropping it out. I only slightly enhanced the contrast in this one.



For my third image, I tried the same object reducing it to only f/6.3. This time the object took up a lot more of the image and appeared much dimmer, pretty much the same thing you'd experience if you put in a higher power eyepiece when doing visual observing.

By the time I took this image, the object had sunk lower towards the horizon and the sky was beginning to deteriorate a bit in that vicinity.



The above objects all have no more than 5 or 6 images stacked. Had I taken more images there would be much less noise, but one of the things I like about my setup is that you can look at a lot of objects in one evening and hop from one to the other. (Besides no matter how good an image I get, Blair will only get a better one!)

So I think of it as an observational tool first, and an imaging system second. (Those of you who heard my talk a couple of years ago will recall that I can access the whole setup from another computer using Remote Desktop; that means I can actually do my observing indoors when I am at home. I see a lot more than I would at the eyepiece and I can stay warm and toasty in the winter.)

The final image turned out a bit better in terms of a good signal-to-noise ratio. It is of M82, a weird galaxy in Ursa Major. (I think I just invented a new galaxy class—"weird".) I took it at f/6.3 which seems to avoid the vignetting problem, and I stacked more images (32). It also shows up as less grainy than the f/3.3 images.

Actually the books call M82 a "peculiar" galaxy, which is a step weirder than "irregular". Irregular galaxies have no apparent structure, whereas peculiar galaxies have additional strangeness. Some believe that M82's peculiarity has to do with powerful galactic winds created by massive star creation within its nucleus. In my image, it appears as if the galaxy had two nuclei.

My observations at SCO confirmed other experimentation I have been doing. In general, if you want to see faint objects, use a reducer that makes your scope very fast, like the f/3.3. For brighter objects, you'll get better results with no reducer or one that only lowers the F ratio a bit, like the f/6.6. (This all assumes beginning with an f/10 scope.) And if you want keeper images, stack a lot of them together to get a better signal-to-noise ratio.

One other thing I have found: blowing some compressed air on all your optics before starting gets rid of little bits of dust that look enormous when magnified. You can get a can at Wal-Mart that'll last you years.

Keji—A Dark Sky Preserve

Dave Chapman

We had two fantastic evenings at Kejimkujik National Park and National Historic Site Saturday and Sunday August 14th and 15th. Everything was perfect. At 6:30 on the Saturday, the official party was on stage at the outdoor theatre: Harry Delong (Park Superintendent and MC), Richard Vanderberg (RASC Halifax Centre President), Mary Lou Whitehorne (RASC President), Hon. Greg Kerr (MP speaking on behalf of the Minister of the Environment), and Matt Labrador (Mi'kmaq interpreter).

Each gave brief, to the point speeches on the significance of the Dark Sky Preserve status. A certificate for the Park was accepted by Gregg Kerr from Mary Lou. Then we had a reception hosted by Friends of Keji with drinks and Dark Sky (chocolate) cake with star and Moon (white icing) decorations.

Jonathan Sheppard (the author of the DSP application) took over after that. Quinn Smith (RASC Halifax Outreach Committee Chair) gave an abbreviated an entertaining all-ages version of "How High is the Sky." Then we awarded the door prize: a Celestron Firstscope IYA2009 edition provided by Atlantic photo Supply, Halifax's only telescope (Celestron) store. This was followed by a folk-rock concert by "Heavy Meadows."

We think there were about 70 people in attendance, perhaps more.

At 9:30 we started public observing in the primary site near the campground. Thanks to Quinn Smith, Andrea Misner, Karl Penney, Mark Dryden, Tony Schellinck, Wayne Mansfield, Mark Richardson, and Sherman Williams for working with the group. The Sky Quality Meter registered 21.6 +/- 0.1 and we had a great view of Keji's Dark Skies. Many Perseid meteors were observed. We did not leave the field until 12:30 a.m. We reckon there were at least 100 people there. It was hard to count!

RASC President Mary Lou Whitehorne presenting the DSP certificate to Hon. Gregg Kerr photo: Dave Chapman

The Keji Park Staff were excellent in running all these events. The RASCAls were left to concentrate on what they do best. Everyone agreed it was a fabulous night.

Andrea Misner and Dave Chapman stayed until Sunday night to watch the Park's regular light pollution show "Blinded by the Light" at the outdoor theatre, and to assist with the regular Sunday night star session. The weather looked iffy until just after we started, when it cleared enough for us to see the sky for about an hour or so.

The Park staff pointed out constellations and stars, and told some stories, including that of "Muin and the Seven Bird Hunters". We showed the group Alcor and Mizar (otherwise known as Chickadee and cooking pot) through the telescope. We also showed the Great Globular Cluster in Hercules.

All in all, a perfect weekend to inaugurate Canada's 12th and Nova Scotia's first Dark Sky Preserve.

Keji at night. Nova Scotia's first Dark Sky Preserve Photos: John McPhee
The lake shot (left) was illuminated by a waning gibbous Moon - note the meteor streak

International Observe The Moon Night

Editor

Saturday September 16th was International Observe the Moon Night. The Halifax Centre put on several events, talks and observing sessions. Here is some of the "Chatter" from our e-mail "list" after the event.

All in all, about 260 participants enjoyed these events. With excellent sky conditions and warm weather on our side, they turned out to be much more successful than I or Dave Chapman had expected.

As the Outreach chairperson please accept my "thank you" to all the members who participated in these events and made it all happen.

Liverpool waterfront: (Wayne Mansfield)

"Last night at Waterfront Park in Liverpool we had an observing session that was visited by 19 guests.

Early in the evening we started off by observing Venus before it set below the tree line. One little girl described it as a 'banana', another gentleman commented that it really does look like a small Moon.

From there we moved on to the main attraction of the evening . "Oh my gosh it's beautiful" was one of the comments a young lady made. I fielded some questions about the "holes all over it" and "is there really water on the Moon?". One of my favourite was a little boy whose face I watched light up when he looked and said "Daddy, it's right in front of my eyeball". One lady tried her hand at taking a photo and was impressed at how easy it was.

Then we had to spend a few minutes on Jupiter, figuratively speaking. One little girl squealed "Mommy, come look at this". Everyone enjoyed seeing the moons and that "dark stripe across the ball". Myself and another gentleman were able to get a confirmed sighting of Uranus while in the area.

Later in the evening, I was visited by a lady walking her dog. She was so impressed by the views, she returned twice more with two groups of her friends she gathered up. All in all it was a successful outing, with lots of inquiries about my next session. Also gave me a chance to mention "Queens County Astronomy Group" on Facebook, and mention about a park in our area (Keji) being declared a Dark Sky Preserve. This could get contagious. Lets hope so!"

Kejimkujik Dark Sky Preserve: (Tony Schellinck)

"By my rough estimate is that there were 40 or so people at the Keji theatre presentation and maybe 30 showed up at the observing field.

My talk was designed to help "newbies" to observe the moon using equipment they are likely to have on hand. I covered five topics, features of the moon to spot when we got to the scopes, how to observe the moon, taking a picture, drawing a picture of moon features, and finally purchasing a first scope; does and don'ts.

The half hour presentation started at about 7:40 and nobody seemed to fall asleep. There were only a few questions, but it seemed most were saving them for the field. The folks telling the moon stories started after me so that gave me time to head to the Keji observing field and get set up.

I set up both my scopes on the CG5 mount. This configuration worked out well as we had two line ups to view through the scopes and some had to wait awhile before they got a view. I had the ED 80 set up at 24X and the 203 mm set up at 40X initially and then switched to 226x for a close-up of the Moon's surface and then Jupiter.

Viewing conditions were superb and we could see a lot of detail in sharp relief, except when thin clouds started to obscure the Moon half way through (even then it was still good). Most claimed they could find all the features I covered in the talk. We switched to Jupiter which was still clear of clouds and the viewing was again excellent. By 10:30 the sky was covered by clouds so we packed up.

The folks at Keji (Jennifer and Colleen) were very helpful and made the evening run smoothly. We got a lot of positive feedback and it appears to have been a great evening for all."

Halifax waterfront: (Dave Chapman)

"We set up on the Halifax Waterfront near Bishop's Landing at 7 p.m. and observed until 11 p.m. with one 10" Dobsonian and a 4" refractor. The 5 participants were Paul Heath, Dave Chapman, Karl Penny, Chris Young, and Mark Dryden.

We showed about 200 people (of all ages) the Moon, and eventually Jupiter. Many of our guest observers were associated with the Atlantic Film Festival, and others were from a cruise ship in the harbour. Several guests

Observing on Halifax Water front: Dave Chapman

stayed for a considerable time. As is typically the case, there were those who had never looked through a telescope before, and those that did not have the slightest interest.

The vast majority were awestruck and delighted with the views, and asked lots of questions. Paul was offered a $20 donation from a German tourist and we beat him up severely afterwards for turning it down. A good time was had by all. We also gave out RASC StarFinders, RASC astro cards (Moon) and copies of "Mary Lou's New Telescope."

Earlier in the day, Paul Heath held 2 Moon workshops for a total of 30 children at the Discovery Centre, Nova Scotia's hands-on science centre."

Pugwash: (Sherman Williams)

"I've just returned from a visit in the Pugwash area, and would like to add my report of observing activities carried out during International Observe the Moon Night. It may sound s bit unusual to say that the session was associated with a graveside internment ceremony held for two friends (one died in April, the other in August).

Without going into all the details that resulted in associating the two events, I will conclude this part by saying that the observing began at the reception held at a cottage near and in full view of the Northumberland Strait (knowing that there was a pretty good chance that the sky would be clear (the 18th), I had brought along my 10 inch Dob.

With the blue waters below, and a clear blue sky above, several people had a look at the Sun which was sporting a pair of nice sunspots. About 5:45 p.m. a few of us were seeing the Moon which by then was had risen about 4 or 5 degrees above the ESE horizon. A mention had been made that it was the International Observe the Moon Night; an invitation was made for those interested, to reconvene around the telescope about sunset.

By 7:45 p.m. Venus, very near the WSW horizon, was the focus of attention. In the telescope its crescent reminded some of a banana, and others were simply amazed. They had never thought of planets being a crescent like the Moon. It wasn't long before Venus was down by the fence posts and Big Red (the telescope) was nearly horizontal. Attention was also drawn to Mars which I had located in binoculars, up and right of Venus by about 5 or 6 degrees.

By about 8 p.m., relating to features of a barn roof, some of the sharp eyed observers could pick out Mars naked-eye. It was now only 4 or 5 degrees above the horizon, in the darkening glow of sunset. I was able to get the scope centred on the planet, not with the expectation of showing a good image, but more for the effect of channeling a few more Martian photons into the eye. At that altitude, Mars was a small, boiling, reddish ball. Not much of an image, but exciting enough to some that they were actually seeing the reddened light of Mars.

By 8:30 p.m. attention had shifted to the Moon. In the scope I focused on three main views at 92x: the area around Tycho, including Clavius, the area around Copernicus, the area around Plato (reminded some of a penny on the Moon), and Sinus Iridum. There were several delighted responses, as for some it was their first view of the Moon in a telescope. I found the Moon Globe app. on my iPod Touch, a great aid in directing the eyepiece view. After seeing the iPod representation, the observer could readily connect with what I wanted them to notice when they looked in the eyepiece.

In all I had about 17 participating. Toward the end of the session I turned the scope on Jupiter which by then was nicely up in the ESE. It was getting chilly and a bit damp with dew but the 7 who were still with me at this point, felt they were compensated for any discomfort, by seeing Jupiter in a telescope. At 92X, Jupiter looked great, with its one remaining dark equatorial belt and its four moons strung out for all to see (Io on one side, Europa, Ganymede and Callisto on the other). I heard one person say they could see the farthest out one with unaided eye (???). Anyway, it was a great sight to share. The bonus, when the magnification was dropped back to 46X, was seeing Uranus in the same field of view with Jupiter.

One question asked was, " I accept what I see is Jupiter, but how do you know that the other little point of light is Uranus and not just a star in the background?" Again, I put my handy little iPod, SkyGazer app (by Carina), to work and also had them note the colour and intensity of the point of light. I underscored that this was another reason for this being a special night (from our point of view, Jupiter and Uranus appearing to be at their closest point and being so closely aligned with the Vernal Equinox).

By-the-way, the evening part of the observing was done at the edge of the same graveyard in which we had laid to rest our friends earlier in the afternoon. All in all it had made a very memorable day and a fitting farewell."

The Moon on OTM Night: Mike Boschat

Cosmic Debris

Odds and Sods from the World of Astronomy and Cosmology.

From Sky and Telescope press release September 27th 2010

"Potentially Habitable" Planet Found

"This is both an incremental and a monumental detection," sums up Sara Seager, an exoplanet specialist at MIT and frequent Sky & Telescope author. Many planets nearly like this one have already been found, so everyone in the exoplanet community was expecting a discovery like this any day now. What's special about this planet is that it orbits in its star's "Goldilocks" temperature zone where liquid water could exist on the surface. But even if such a discovery was expected, this is the one that will forever go into the record books.

That planet is Gliese 581g, one of at least six low-mass worlds orbiting the dim red-dwarf star Gliese 581 just 20 light-years away in Libra. The orbits were teased apart from 240 high-precision radial-velocity measurements, spanning 11 years, tracking the tiny gravitational wobbles that the planets induce in the star.

The star is Gliese 581, a dim M3 dwarf with about a third the Sun's diameter, a third the Sun's mass, and 1.3% of the Sun's energy output. Although it's one of our near stellar neighbours, it shines at only magnitude 10.6; it's visible in most amateur telescopes but not binoculars (at right ascension 15h 19.4m, declination –7° 43').

Its six known planets all circle it more closely than Earth orbits the Sun. They form a miniature solar system, as befits such a miniature star. Two of the previously known planets, c and d, orbit just inside and outside the liquid-water temperature zone. The new one, g, lands between them. The exact definition of the "habitable zone," however, assumes that the planets have atmospheres providing greenhouse effects not too different from Earth's. And for a long time, that will really be just a guess.

The new planet has between 3.1 and 4.3 Earth masses, based on its gravitational effect and an upper limit set by orbital stability of the whole system. It is probably mostly rock and iron like Earth. That would give it a diameter 1.2 to 1.4 times Earth's diameter (allowing for its stronger gravity to compress its interior more), and a surface gravity of about 1.5 to 2 gs. In other words, after your starship landing craft sets down you could stand up and walk around with effort. Not that we know Gliese 581g even has a solid surface to land on. It could be swathed in a super-deep, super-dense atmosphere, or it could be a global-ocean water world.

The planet orbits closely enough to its dim star (with a period of 36.6 days) that its rotation has surely become tidally locked to its period of revolution, so that one side faces the star in permanent day and the other faces away in permanent night. This situation is not as problematic as exoplanet buffs once feared. A tidally locked world, it turns out, would need an atmosphere only about 1% as thick as Earth's to distribute enough heat from the dayside to the nightside so that the atmosphere would not freeze out as a solid crust on the nightside.

Nor would the winds be supersonic screamers tearing everything flat, as planetologists once speculated. Based on detailed atmospheric modeling "the surface winds would be quite benign," said team member Steven Vogt (Lick Observatory) at a press conference this afternoon. High-altitude jet streams would do most of the heat transport; the surface would experience Earthly sorts of breezes of about 0 to 40 knots. Parts of such a world, said Vogt, might be "a benign, comfortable place to live."

If the atmosphere isn't too thick, you could even pick your ideal temperature zone between the hot permanent noon point and the cold permanent midnight point. "Any emerging life forms would have a wide range of stable climates to choose from and to evolve around, depending on their longitude," Vogt said.

Artist's concept of the dim red dwarf star Gliese 581 and company. In reality, even a "red" star would be dazzling yellow-orange if seen close up.

Of course, there's a big difference between "potentially habitable" and habitable for real. Seager says she already has a student working on the range of all possible atmospheres that a 3-Earth-mass body could realistically be expected to have (as best as we know), to get an idea of what fraction of such worlds might indeed have liquid water.

Really, however, the most important thing about Gliese 581g is its closeness. Only 116 stars of any kind are nearer to us, and only 9 of these have been tracked thoroughly enough to find any such planets if they exist. The fact that one was found so close so soon, says team member Paul Butler, suggests that at least 15% or 20% of all stars have habitable worlds. And that's even before we can detect planets with 1 Earth mass or less. So it's safe to day that there are tens of billions of potentially life-friendly worlds in our Milky Way galaxy.

But we kinda knew that.

Says Seager, "There should be many more of these soon."