Nova Notes

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

Volume 34 | Number 6 | December 2003

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Inside...

Astrophoto of the Month

Clint Shannon & Dave Lane, Omega Centauri (NGC 5139)

10-minute guided exposure on Kodak Ektachrome P1600 with a Nikon F2A through a Tele Vue Genesis 4" refractor (500ml fl @ f5). From the Texas Star Party, Prude Ranch, Ft. Davis, Texas, May 18th, 2001.

Nova Notes email

Submissions for Nova Notes should now be emailed to agatto@ns.sympatico.ca, this is my new home email address, the previous address was only accessible during business hours. – Thanks, MG

As heard on hfxrasc@rasc.ca...

If you're a member with email, why not become part of the Centre's email list? The list is a great resource for people looking for other members to observe with, for reminders of upcoming astronomical events, or for sharing information. Members who observe at St. Croix usually post a notice to say if they'll be out that night. Log on to our website (www.halifax.rasc.ca) to get signed up and you too could participate in lively intellectual discussions, or at least read them!

Telescope fans in cold weather

I travel to Alberta a few times each year to visit family. I recently purchased an 8" f/8 Discovery to leave at the Alberta location so I could have a decent scope to use when I am visiting the area. I did a number of common modifications to the telescope which included installing three small fans on a board, which is mounted just below the primary mirror cell. The fans suck air down the tube and exhaust out the bottom of the tube. The fans are operated off a small 12V gel cell with a rheostat to control their speed. I have calculated that with the fans operating at their lowest setting, I am getting two tube changes of air every minute.

Over my recent Christmas visit, I spent about five nights observing with the scope. The temperature varied, but was always below zero (Celsius) which meant there was a significant amount of ice crystals in the air making the transparency quite poor for this location (LM from ~4.9 to 5.8). I found the little gel cell did not operate well in the cold weather and I didn't always use the fans. I was normally viewing planets using a 7mm Pentax (230x) and when conditions allowed, I used a 5.2 mm Pentax (310x). The views at 310x were usually sharp only for perhaps 60% – 70% of the time as the sky steadied for a few seconds.

During the evening of December 27, the clear sky clock predicted good seeing (5 out of 6). My brother and I set up to do some planetary observing just before midnight. The temperature was -21° C and never changed through our observing session. I did install the battery and I turned the fans on to their lowest setting. Over the next 15 or 20 minutes, we observed Saturn and slowly increased the power as conditions allowed. As during the previous sessions, we began at 230x and moved to 310x after about 10 minutes. After another 10 minutes, the image was very steady and I decided to try more power. I placed a 9mm Nagler (T6) in a 2.5x Powermate for 450x. Much to my surprise, the image was steady and very crisp. Over the next 20 minutes we traded views and marvelled at the wondrous image of Saturn.

At some point while my brother was viewing, I leaned around and switched the fans off. A few minutes later, he reported that he could not,t get the image to focus. I told him that I had shut the fans down about 5 minutes earlier. We tried to turn the fans on again, but the little gel cell would not power them. We decided to take a break and go in for tea and I placed the gel cell on a trickle charger in the garage.

After an hour we came out and hooked up the battery and it powered the fans at their low setting just fine. Once again, it took about 15 minutes or so to get to 450x, but it worked and the image was very steady. After about 20 minutes the battery gave out and the fans quit. This was noticeable as the image deteriorated and at 450x was not sharp at all. We commented on this and placed the battery on charge again and went in for more tea.

About an hour later, my brother went to bed and I went out for more observing. Jupiter was high enough to try viewing at this point. The pattern repeated itself – about 15 minutes to get to high power while running the fans. Saturn was rock steady at 450x and Jupiter was steady only about 25% of the time. In the first 5 minutes of this session, Jupiter was not sharp at all at 310x. I could only focus a sharp image at 450x after running the fans for 15 minutes or so. After viewing both planets for about 20 minutes, I was chilled so I packed up and went to bed.

My preliminary conclusions are that running the fans indeed makes quite a difference in the ability to use high power. What would normally be considered limits due to seeing conditions can be mitigated by running fans in this configuration. Without the fans, 310x was effective part of the time. After running the fans for 15 minutes, 450x was rock steady on Saturn and moderately effective on Jupiter. The part that still confuses me is that there was no change in the ambient temperature during our observing session – it may have dropped a degree C during the two hours prior to our observing. The telescope had been outside all day and was fully cooled when we began observing.

Although this is not a comprehensive test, it certainly has sold me on the value of operating fans to get the most out of high power viewing.

– Gary Weber (gweber@hfx.eastlink.ca)

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

Nova Notes is published bi-monthly in February, April, June, August, October and December. The opinions expressed herein are not necessarily those of the Halifax Centre.

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

Contact the editor at the following:

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

Material for the next issue should reach the editor by Feb. 15

eyes Up!

eyes Up! *is a forum for observing news from Centre members. This is where you can see what your fellow members have been looking at for the last two months and share your own latest discoveries.*

News may include observing reports, observational project status, witnessed daytime or nighttime astronomical phenomena, new equipment reviews, or any other notes of observational interest.

Fr. Bill Lonc—Radio Astronomy Projects

Perhaps readers might be interested in knowing that the second edition of my Radio Astronomy Projects has been published recently. It is available in the SMU Bookstore or from Radiosky@radiosky.com

Pat d'Entremont—Saturn

I had my best view ever of Saturn, at 200X. Saw the polar shading & equatorial band very clearly, as well as the Cassini Division. The rings haven't closed up a whole lot since last year. I think one of the things that makes Saturn such a great object to keep revisiting is the 3-dimensionality of it, with the rings passing in front and behind it.

Roy Bishop–Observing Roy Bishop

I've enjoyed looking at the latest burst of observing reports. Here is my contribution:

I spent Sunday and Monday evenings observing minor planet #6901 with my 444-mm at 300x, first tracking it down, and then watching it drift against the background stars. At magnitude 15.5 6901 is brighter this month than it has been since its discovery by Carolyn and Eugene Shoemaker in 1989.

I obtained its position from:
http://ssd.jpl.nasa.gov/cgi-bin/eph?sstr=6901&s_sb=Search&c_time=%2B20031015000000.000%2C%2B20031030000000.000%2C0%2C1%2Cd%2C%2CC&c_loc=500%3BGeocentric%3B0.%2C0.%2C0.%2Cm&c_quan=0108c0101%2CJHA%2C%2C0
and used this information to plot its track on finder charts which go to mag 18 or 19 obtained from:
http://stdatu.stsci.edu/dss/index.html

Mike Boschat—Eclipse sequence

Mike sent me this sequence of images from the Nov 8/9 lunar eclipse.

Perhaps I should have expected it, but I was very impressed that 6901 was right on schedule, in time and in space. At 300x I could not detect any deviation from the predicted track, including the times when it passed near background stars!

My old eyes can still glimpse mag 5.8 naked eye. At mag 15.5, 6901 was 10 exp 0.4 x (15.5 – 5.8) = 7600 times dimmer (see page 30 of your Handbook). However, my 444 mm mirror gathers (444/5) exp 2 = 7900 times more light than can my 5 mm eye, thus I could see 6901. The lower brightness of the background sky as viewed at 300x (exit pupil 1.5 mm) also worked in my favour.

Without my planetarium program I could not have keyed the small-scale finding charts to the stars visible in my finder telescopes (My telescope is a "u-point" not a "go-to"). Without my computer and the internet I could not have produced the small-scale finding charts. Without 444 mm aperture, sharp optics, and a dark sky I could not have seen 6901.

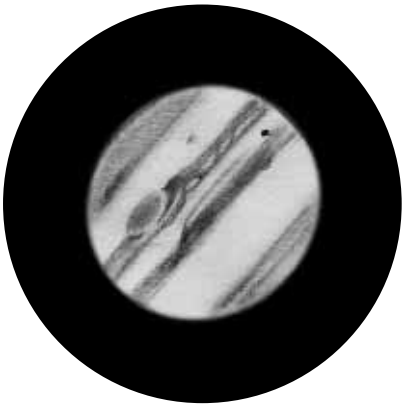
The satisfaction of being able to precisely track down 6901 was almost as special as just watching it.

Marc Bourque—Saturn Observation

I looked outside at about 11 P.M. last night and everything looked quite steady and clear here in Bedford, so out I went to poke around the sky a bit. After looking at M42 for a while it struck me just how steady it was. The Trapezium was crystal clear and showed no sign of distortion even up to 207x (min. exit pupil for my scope ... Stellarvue 102EDT & 3mm Radian) So off to Saturn I went … wow! Very steady and clear, and only improved in the next half hour. Armed with the afore-mentioned combo I settled down to it. Cassini division was obvious and seen almost all around, a nice bright edge on the B ring made the crepe ring easily seen also. Darkening polar region, equatorial belt and a nice ring shadow on the planet made it all the better … it struck me with a three dimensional feel, as if someone had dropped a marble in a pool of water. Moons in my field of view were easy too, Dione and Tethys were dim but sharp, Rhea and Titan were easy. So, if you missed last night, you missed one of the great seeing nights of 2004 (11 P.M. pickering ~6, 12 A.M. pickering ~8). Tradition states that what you do / what happens on New Year's Day follows for the rest of the year … let's hope this is typical seeing for 2004 ;-)

Michael Gatto—Jupiter sketch

The morning of November 18th provided very steady seeing for this sketch of Jupiter. This was done from home in Dartmouth, between 4 and 5:30 A.M., the temperature was 0° and very calm. The dark circle is Io's shadow. One interesting feature was a small dark area floating all alone inside the South Tropical zone (bright "belt") above the GRS, the object was not continuously visible but was faintly obvious from time to time.



A Star Party at the Hebbville Academy

David Griffith

For the past two years I have had the pleasure of talking to the Grade 9 students of Hebbville Academy as a guest speaker during their astronomy unit. Last year, due to scheduling issues, I was able to visit the class but we didn't have a chance to get outside to do any observing. I am happy to announce that this year the schedule and even Mother Nature were more accommodating.

Several weeks prior to our star party, I visited the Grade 9 French Immersion class and spoke to an enthusiastic group about sky motions, the seasons, constellations and star maps, and had each student make a fully functional planisphere. The templates and instructions are located online at the Lawrence Hall of Science website:

http://www.lhs.berkeley.edu/starclock/skywheel.html

The students were very enthusiastic, some even choosing to hang around during recess to ask questions about some of the equipment I brought along for demonstration. I concluded the workshop with an invitation to the students to attend the star party on the 17th, to be held on the school soccer field. I would not be disappointed!

After arriving early to set up my 8" Dob and my Astroscan, I was pleased to see others trickling onto the field with scopes of various size and design. Students and parents alike began to increase in number, just as Mother Nature decided to throw us a curve ball. Seemingly out of nowhere, clouds began to take over the sky. Undaunted, while steaming hot chocolate was being prepared inside, we waited and compared notes about scopes and various sky events. Once it was apparent everyone had arrived, I began with a little pep talk about light pollution and how fortunate we rural folk are to have so little of it. Hats off to the maintenance people, who shut down all of the outside security lights for this event. It made a huge difference in the quality of observing! I guess this was our night, as shortly after the lights went out, the clouds dispersed completely, revealing a gorgeous autumn sky.

Before treating the students and parents to telescopic objects, I showed the group how to find Polaris, and how to locate some common constellations and asterisms, as well as M-31, the most distant naked-eye object, the Pleiades, and of course the Milky Way. Due to the large numbers, I limited the telescopic objects to a few showcases such as M31, Pleiades, M-57, and of course Mars, though the seeing for Mars wasn't very good. As the evening concluded, about 2 hours later, everyone was treated to some steaming hot chocolate, courtesy of Grade 9 teacher, Mme Babin.

As sky gazers, we often take delight in the quiet solitude of our nights under the stars, away from the lights, the crowds, and the daily distractions of life. Although guiding a group of 50 people on a tour of the heavens may be hectic and anything but quiet once the questions start coming, it is a wonderful and rewarding experience to share this passion we have for the skies and to perhaps inspire a future generation. As we concluded what turned out to be a memorable evening, I was treated to round of applause. But really, I didn't deserve any of it. The real stars of the show were of course, above me. ✭

Hawaiian "Transit of Venus" Mystery

David Chapman

On a recent trip to the "Big Island of Hawaii, apart from going to see live volcanos and the observatories at the summit of Mauna Kea, we also poked around the town of Kailua on the Kona coast. (I also tried surfing, but that's another story!) We were wandering around the grounds of the "palace" of one of the Hawaiian king, when my wife noticed a special survey mark. This is reproduced here, but is also available online (in colour) at

http://www.accesswave.ca/~chapmand/photos/Hawaii/source/69.htm

The survey mark displays the legend "HTS 1929...Transit of Venus...1829". HTS stands for Hawaii Territory Survey. No one in the information centre seemed to know anything about it.

Upon returning, I did a little research. There were transits of Venus in 1874 and 1882, which possibly could have been observed from Hawaii, although they were late in the day and early in the morning. Perhaps the survey marker was placed there in 1829 and used in the observation of the transit, and commemorated in 1929? The design looks vaguely Art Deco.

I decided to email the Hawaii State Survey office to see if I could find out more. this is what they replied: "On September 9, 1874, the British Transit of Venus Expedition arrived at Honolulu to observe the transit of the planet Venus across the Sun, "Transit Day" being December 8, 1874. An observatory was set up in Honolulu with two auxiliary stations, one in Waimea, Island of Kauai and the other on the Hulihee Palace grounds in Kailua, Kona, Island of Hawaii. The Hawaiian Government Survey later incorporated these observatory sites into the triangulation network of the islands. The site in Kailua was probably reset in 1929 by the Hawaii Territory Survey. Hulihee Palace was built in 1838 and restored as a museum in 1927. No significance of the year 1829 could be found." ✯

December 2003 Meeting Report

Stephen Tancock

After my standard pitch about the exceptional value of membership in the RASC – including all the wonderful merchandise one could get to give as presents – and the usual few announcements, I moved on to introduce the speaker for the evening, Pat Kelly and his presentation, Binary Stars: The Astronomer's Friend.

Pat started with a tour around the sky noting a few more popular stars and pointed out that average stars are not alone, but part of multiple star systems. Next he took us a step further into Parallax and how it allows astronomers to estimate distances. This allows them to compare stars in magnitude, and develop ways to figure out "absolute magnitude" an example of energy given off from the stars. Pat showed us that with a Spectrum, astronomers could understand the relationship of the energy output compared to the light output and surface temperature. This is where he sprung the Hertzsprung/Russell Diagram on us, and showed that by plotting the data we could start to see that the luminance and temperature could lead us to determine the size of stars. Spectrum analysis of the dark "Fraunhofer lines" show us the elements in stars, and the spectrum can also show us, with a careful aim, the radial velocity and rotational velocity. Pat then touched on Kepler's 3 laws of planetary motion, and how Newton later had shown how Kepler's laws worked. A little side step into using "planetary" motion with binary stars to determine the mass of stars was our next stop. Over time a binary pair's motion will show the centre of mass for the two stars, and as a result, the mass of each star can be determined. The spectrum could also give the "orbital" period of binary pairs. Pat held the audience's attention with a most entertaining set of examples of a neat program called Binary Star. By changing some parameters it shows what would change in the star's spectrum. And he even showed how with all the information astronomers could figure out a lot – even the tilt of the binary pair's orbital plane.

If there were a few more bits after that I apologize for not having it here, it's Pat's fault – your talk was so interesting sometimes I forgot to keep writing.

After the break and a few more announcements, Mike Falk donated a book by Thomas Harding to the library, and Dave Chapman also donated a book he had just finished reviewing for the Journal … thanks guys!

Dave Lane gave the crowd a review of the upcoming months events; members night times, the Geminids and YES the rising of VENUS.

Dave Lane, our observing chair, will be stepping down this year and will not be on the Centre's council for probably the first time in 12 years! He claims he wanted a break, hmmm, ECU 4.0? Anyway … on the membership's behalf I thanked Dave for his long devotion to the Centre and all the efforts he has made over the years. Thank again Dave !

Paul Evans, the good sport that he is, presented a Handbook talk on telescope exit pupils – even after being "bumped" several times by meeting speaker juggling by me, sorry!

Paul noted a few emails on the list from people showing interest in the subject, so he chose to help clarify what it is all about. Paul first described that an "exit pupil" is the size of the cone of light exiting the viewing end of a telescope's optical system. He next spoke of the useful limits of high magnification and referred to the well-known "floaters" (images of things on your own cornea) one can see when using such high powers. (Due to the very small exit pupil.) Paul then went into some depth on how you can learn the characteristics of an optical system, and your own optical system (your eyes) see pg. 47 of the Observer's Handbook. The human eye has limits on how large the pupil can open, which declines with age, and your observing may need some adjusting. Through combinations of equipment and experimentation, one can learn ways to hold on to those excellent Rich Field views. He also described things you can do to find the useful magnification range from the very low to high and even push the edge of it while still getting a decent exit pupil. For your reference, Paul's talk was from Pages 45-48 of the 2004 Observer's Handbook.

Note: If you would like to see a talk on a particular section of the Observer's Handbook, or perhaps do a talk yourself, please feel free to let myself or any other member of the council know. ✯

2003 Leonid Meteor Shower

Michael Boschat

As Nov.18th rolled around I made my decision to head off Dalhousie University even though I still was getting over a cold virus I caught a day after the Lunar Eclipse on the 8th! One good thing was the wind was not blowing like last year when it was gusting to 98 km/h and we had a Full Moon! So that morning I went through my "meteor list" of what I was going to take for this expedition, film, camera, cable release, food…and so on.

I biked to Dal arriving about 7:30 p.m. but I did not set up my camera by the observatory on our "Nuclear Light Polluted Roof" until I was sure the Leonids were going to produce some meteors like last year. My plan was to wait until about 11:30 p.m. then try looking for the so-called Earthgrazers. I messed about listening to the radio and looking at SOHO images for comets to kill time. Brian arrived later and we talked so by 11:30 p.m. we decided to go up for an hour's observing run. I did not take my camera as I was not ready to start photographing until later. We were on the roof and just sat there looking at the sky. I looked at the Orion area and Brian was watching Auriga. The north sky was bright from light pollution and I could see only 4 stars in Ursa Minor. We decided the limiting magnitude was about 4.5. I was looking at the Pleiades and counted 8 stars, Brian could only see 5. Between 0340-0440 UT I had seen only 3 Leonids, the best one at that point was a blue +1 Leonid that left a very faint 1–2 second train. Brian saw a possible Taurid and one Leonid of about 0 magnitude.

By 0400 UT the radiant was on the horizon but I saw no Earthgrazers. At this point in time I decided not to bother with the camera and to head home as it was going to be a slow shower. I left by 0445 UT. Arriving back at the apartment I turned on the meteor radio and heard a few Leonids, there was no radio saturation by the Leonids like last year's shower. I monitored the radio until 0600 UT then went out into the driveway and made a one-hour observation, again I saw only 2 Leonids. I went in and listened to the radio until 0730 UT but the rates were only in the teens and I went out again until 0830 UT and saw only 3 Leonids. After 0830 UT I called it a day and went to bed.

I woke about 7:45 a.m. and turned the radio on but only started counting from 1200–1700 UT. The radio rates slowly increase and between 1400–1500 UT there were good pings but by the next hour they began to drop, see the graph of my radio observations below.

In all, this year's shower to me personally was not that good, but at least I was here to see the last of the Leonid storm … or is it?

Michael Boschat

Meteor Shower Report

Date:	Nov.18/19, 2003
Begin:	03:40 UT
End:	08:30 UT
Observer:	Michael Boschat
Location:	Halifax, Nova Scotia, Canada
Recording Method:	Eye

Start	End	Teff	LM	Leo	Spo	Total	Cloud
03:40	04:40	1.00	4.5	3	0	3	0%
06:00	07:00	1.00	4.5	2	0	2	0%
07:30	08:30	1.00	4.5	3	0	3	Low fog

Magnitudes:	-2	-1	0	1	2
Leo	1	1	1	4	1
Spo	—	—	—	—	—

Average Magnitudes:
LEO 0.3 SPOR —

Colors: Red=2 Blue=3 White=2

Comments: Not a really spectacular shower this year even though conditions were better for viewing. ✯

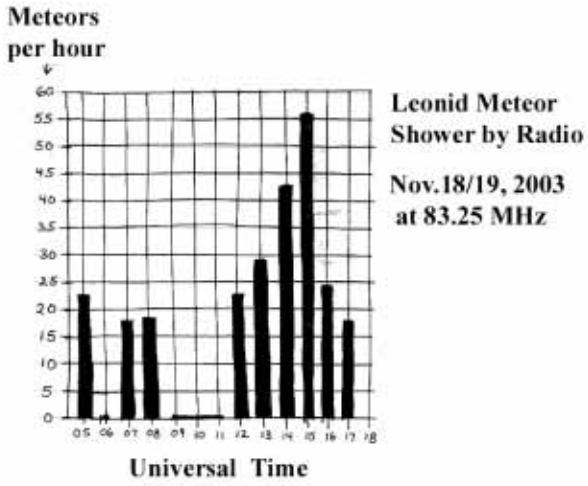


Image taken Dec.28 - 2200 UT with digital camera held over 25mm eyepiece on 15cm Maksutov 1100mm fl. – Mike B.

This "shot" (2 photos stitched together) was taken last fall, the sky was amazing – the clouds were broken behind me giving full sun, but behind SCO it was still dramatically cloudy – MG

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.

Members' Night

Every weekend closest to the new Moon there is a Members' Night at St. Croix. The purpose of members' night is to attract members from the centre to share an evening of observing with other members. It's also a great night for beginners to try out different scopes and see the sky under dark conditions. For more information or transportation arrangements, please contact the Observing Chairman Craig Levine at 852-1245. *Dates for Members' Nights for the following few months are:*

Friday. Jan. 23rd *(Rain date, Sat. Jan. 24th)* **Sat. Feb. 21st**

Directions from Halifax

(from Bayers Road Shopping Centre)

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

Become a St. Croix Key Holder

For a modest key fee, members in good standing for more than a year who have been briefed on observatory can gain access to the St.Croix facility. For more information on becoming a key holder, contact the Observing Chairman Craig Levine at 852-1245.

RULES FOR THE 17.5" SCOPE *(OR ANY RASC SCOPE AT SCO)*

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

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

Please contact the Observing Chairman Craig Levine for more information or to book the scope at 852-1245.

Meeting Announcements

Halifax Centre of the Royal Astronomical Society of Canada

Friday, January 16, 2004

Dave Lane

Topic: Designing, Building, and Using a Backyard Observatory for Research, (with a detailed description of the supernovae search program now underway)

Friday, February 20, 2004

The meeting topic is yet to be determined at time of publication, watch the email list and website for details closer to the meeting date.

Here are a few attempts I took at digital photography (simple eyepiece projection with a Canon A70), we got the camera over Christmas and so far it is working great. – Michael

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

Members of the general public are welcome.

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

Room 176 Loyola Building
Saint Mary's University *(See Map Below)*

The Halifax RASC Executive meetings begin at 7:00 P.M., and members are welcome to attend.

Halifax RASC Executive 2004

Honorary President	Dr. Roy Bishop	
President	Steve Tancock	465-4092
1st vice-president	Pat Kelly	798-3329
2nd vice-president	Pat d'Entremont	497-1153
Secretary	Andrea Misner	491-8668 x 4808
Treasurer	Paul Evans	423-4746
Nova Notes Editor	Michael Gatto	453-5486
National Rep.	Pat Kelly	798-3329
Librarian	Bill Thurlow	
Observing Chairman	Craig Levine	852-1245
Councilor	Shawna Mitchell	865-7026
Councilor	Gary Weber	454-8264

Meeting Location

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

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

P = Parking