Nova Notes

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

Volume 33 | Number 3 | June 2002

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This Issue...

Astrophoto of the Month *Zodiacal Light, Mauna Kea, Hawaii*

Here is a photo I took from the summit of Mauna Kea, beside the 0.6m telescope. It is the Zodiacal Light in the west, with bright Venus close to the horizon within the Zodiacal Light. Above the pyramid of light is Mars and the Pleiades (Subaru) above the Subaru (Pleiades) Telescope. Fixed camera, 2 minute exposure on Kodak PMZ1000 film, 35mm lens at f/2.8. On this night we could see the Zodiacal Bridge spanning the entire sky, as well as the Gegenschein! Who says you can't see for beans in the rarified air at the summit of Mauna Kea??? — Mary Lou Whitehorne.

Letter from the Editor

I just wanted to take a moment to speak about a very valuable resource this club has to offer. On top of the meetings, publications, and the great resource we have in the SCO, one can't overlook the honest advice that's freely offered from members to those with a question. I have seen, especially in the last few weeks, some great email traffic regarding eyepiece designs, and the magnitudes of galaxies that were especially helpful to me, and I'm sure many other members. Gaining from the years of experience that fellow members represent is invaluable, and one of the best reasons to affiliate yourself with a club like this.

I personally have sent a lot of questions to individual members as of late, and in return I've received nothing but very prompt, honest, and helpful responses. On top of that, I have a had a great opportunity to try out other members' equipment and scopes while being out at the SCO. There is plenty of literature on the web and elsewhere to help people make decisions on equipment, but nothing beats being able to sit under the stars and use equipment that otherwise you would have to just read about. I would like to sincerely thank all the members who took the time to respond to my email questions; Craig Levine, Steve Tancock, Paul Gray, Dave Lane, Gary Weber, and especially Daryl Dewolfe and Doug Pitcairn.

If you've got a question about anything at all, don't be afraid to put it to this fine group – use one of the best resources our Halifax Centre has to offer.

– Michael Gatto

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!

Question about magnitudes of galaxies

This question results from observing M40 Friday night. I discovered that this, the most boring of Messier's, is made more interesting by viewing it as part of a triangular pattern with 70 UMa and galaxy NGC 4290. They were all easily viewed at 74x, the galaxy was a bit faint but immediately apparent.

My question comes from the variance of magnitudes reported for this galaxy. All the professional catalogs give this galaxy a magnitude of between 12.5 and 12.8, one being so confident as to pinpoint to 12.66. Now SAC (an amateur organization I believe) rates it a 11.8. If I was given a list of magnitudes to pick from before I hand I would have chose 11.8 as the most likely because of the relative ease in viewing it. Can anyone shed any light on this variance?

- Keith Lowe (keith42@accesswave.ca)

Question about magnitudes of galaxies

This seems to be the same problem that I encountered and put to a question recently as well: Which magnitude do you pay attention to when picking targets and making observation notes after the fact? The Uranometria 2000 Field Guide 2nd ed. gives NGC 4290 a visual magnitude of 11.8 (if all of its light were collected into a point source) and a surface brightness (magnitude divided by area) of 13.0. I'm still a bit puzzled about this, particularly after viewing some really faint fuzzies in Markarian's chain.

- Craig Levine (clevine@hfx.eastlink.ca)

Question about magnitudes of galaxies

There are two main types of galaxy magnitudes that make it into the literature (and often not specified). These are visual and photographic magnitudes. The visual is centred on the "green" V filter used by professional astronomers. The photographic magnitudes (often given as "p") are taken from blue sensitive plates. In my experience, "p" magnitudes appear about 0.5 magnitude fainter than their V equivalents.

In both cases these magnitudes are supposed to be integrated magnitudes, so larger galaxies of the same magnitude will appear fainter. Probably the most consistent source of magnitudes for galaxies is the principle galaxy catalog which is included in V3.2 of ECU. It measures the integrated magnitude out to a consistent surface brightness.

- Dave Lane (dlane@ap.stmarys.ca)

Question about magnitudes of galaxies

OK, thanks Dave, that explains it. Hey we did have periods of excellent conditions that night Craig because PGC rates that galaxy at 12.8 and it was an easy target.

HA! – snorkeling and chasing dumb fish. You could have been viewing M40 at St. Croix (northern division). Seriously though, your Mauna Kea leg must have been an incredible experience. I can't wait to hear the stories from you all. I would like to experience that someday too but not anytime soon. How will you be able to motivate yourselves to bust out mere 17" telescopes in our mag 6 skies after that!

- Keith Lowe (keith42@accesswave.ca)

Question about magnitudes of galaxies

Thanks for the clarification on the two main magnitudes usually given for galaxies. One bit of confusion remains for me, though; should I more-or-less disregard surface brightness values when planning observing targets? I enjoy the heck out of this hobby, but it seems that the more I learn, the less I know!

- Craig Levine (clevine@hfx.eastlink.ca)

Question about magnitudes of galaxies

No, don't disregard surface brightness - it is in effect the most important value since it takes into account the galaxy's overall brightness and its size on the sky. However more often than not its not available or perhaps not reliable (example: how does it handle galaxies with stellar nuclei vs. non-stellar ones). I tend to use the magnitude and the object size to judge the difficulty of an object before going out to gaze.

- Dave Lane (dlane@ap.stmarys.ca)

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Halifax, Nova Scotia
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Articles on any aspect of Astronomy will be considered for publication.

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

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

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

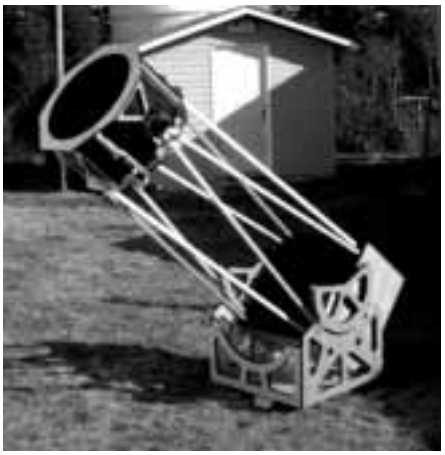
Material for the next issue should reach the editor by July 26

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.

Steve Tancock—First Light of the Centre's 17" Scope



We had a ball at St. Croix with the 17.5" and its official "first light" look at the comet Ikeya Zhang. After that we went nuts on the faint fuzzies! Among the other sights viewed with the scope on first light night were M65, M66, NGC 3628, M51,NGC 5195, M104, M44, M13, M81, M82, NGC 884, NGC 869, M86, M87, M84, NGC4438, NGC 4388 with "possibilities" while hopping around on M90, M88, M89, M58, M59 and M60.

I don't think I have ever had a better time at St. Croix, thanks all, and thanks for the ride Rollie and Gary.

Gary Weber—Fireball

Last night (4/20/02) Paul Heath and I went to SCO. I wanted to give first light to my 12.5 inch f/6 Starsplitter. We got there early to have a bit of waning daylight to putter about. We arrived early enough to be able to spot all the five planets with the naked eye at the same time. By the time Mars made its appearance, Mercury was still visible as it was dipping into the trees. This portends to be a great spring for observing planetary conjunctions.

At approximately 9:56 P.M., I witnessed an incredible fireball that appeared just beneath and left of Jupiter in Monoceros about 25° above the horizon.

I was leaned against my car looking West, about 5° from where it made its initial appearance and it came into view – it was running parallel to the horizon. Immediately upon appearing, it brightened with a distinctive orange tail and then flared to perhaps Mag. –5 to –6, producing colour of yellow and deep orange/red flowing into a wide, multicoloured tail. It diminished in brightness then flared again to about –4 and then it dimmed and finally disappeared into Perseus.

It lasted long enough for me to call Paul, who looked up from his EP and caught the second flare of the meteorite. He was quite impressed with what he saw, and he missed the first, major flare. It was perhaps one of the most spectacular fireballs I have ever seen. There is a lot said for that wide angle view with just our eyes.

It was just another fine night under the stars. Even with the moon at first quarter it beats "Hockey Night in Canada" on TV.

David M.F. Chapman—Ariane Rocket Launch

Tonight, I saw my second rocket launch from home. (The first was the Shuttle several years ago.)

It was cloudy earlier, but cleared up in time. The ground track from French Guiana arced North and slightly West, mostly over the Atlantic, but cutting in to North America over Cape Breton, Nova Scotia. I monitored the web site until the launch at 10:31 ADT, then went outside with binos.

I searched the SE sky until about 10:52, and was almost ready to give up, when I glanced up and saw an odd sight overhead: a moving bright star with a glowing ball all around. I trained the binos on the apparition, and saw what looked like a planetary nebula in fast forward evolution. The glowing ball had a two-lobed structure within an almost perfect circle. As I watched, the glow spread and dissipated, while the point of light moved on.

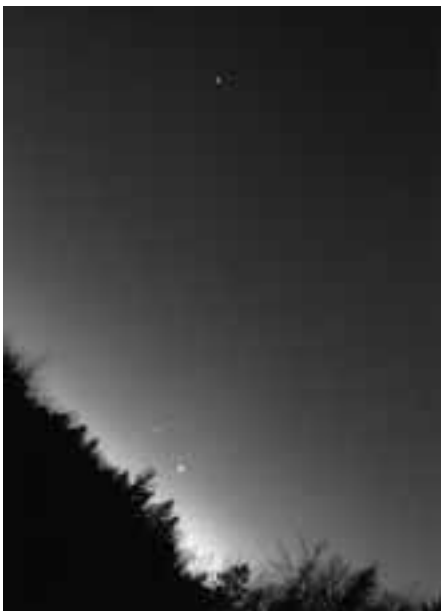
I knew it was Ariane, but this looked nothing like the Shuttle launch. There was no colour, just this while glow perhaps with a tinge of blue. I imagined I saw some reddening, but the impression did not last. The spacecraft seemed to come out of nowhere, or maybe I was looking in the wrong place. I did not expect it to be so high in elevation!

I followed the point of light, thinking that the action was over. Then I saw a plume of white, like a comet. This plume grew and dissipated, and the point of light gradually moved into the North, getting dimmer all the time. I stopped watching at 10:57 or so. I am not sure what I saw, exactly. I could perhaps reconstruct it from the web site. I know that the Spot 5 satellite was to be inserted into orbit, and that other instruments were to remain in Stage 3.

This was a remarkable event, and Nova Scotians were uniquely placed to observe it.

Paul Heath—Planetary Alignment

Here is a shot showing the planetary alignment. Jupiter is at the top of the frame, then just over the trees we have Saturn and Mars side by just over Venus forming a nice traingle, with Mercury just dipping into the trees. *(Not visible in this reproduction)*



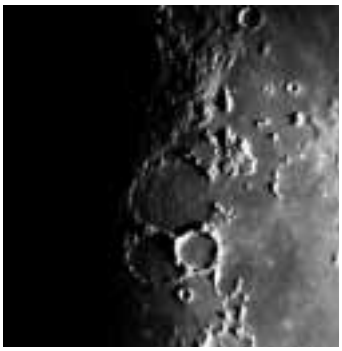
Daryl Dewolf—Slimers Delight at Oscar's First Light!

Recently there have been several suggestions for names for the 17.5" Centre dob. We thought you should know that the much maligned Slimeball Observers have put the scope through it's shakedown trials at St. Croix searching out some obscure galaxy groups up to 15th magnitude. While it is absolutely no reflection on the exquisite construction of the scope by Steve T. we have christened the scope with our own "pet" name. Though it may be under our control only one night a month (regular readers should know what night!) we shall refer to the scope as "Oscar", the venerable grouch from Sesame Street. Like the Slimeball Observers, who are sometimes the object of derision by the astro community-at-large, Oscar pursues a distinctive lifestyle in the hope of (in this context "astronomical") happiness.

Graeme Hill—Digital Photography

These are hand-held digital images taken with the Sony Cyber-Shot, 1.3 meg pix camera, with a Skywatcher 203mm Dob. Eyepiece(s) used are a 25mm super kellner for the "full disk" shots (48X), the same EP in a 2X barlow with the camera zoomed in 5X for the close up wide angle type shots, and a 10mm SK EP for the close up shots, with the cam zoomed in 5X.

Also see page 8 for additional shot.



You may forward your submissions for eyesUp! to Observing Chair Dave Lane, or the Nova Notes Editor Michael Gatto by email, mail or phone:

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Roy Bishop wins Chant Medal

Dave Chapman

You may have already heard that Dr. Roy Bishop, The Honorary President of the RASC Halifax Centre, was awarded the prestigious Chant Medal by the RASC. Congratulations Roy! I happen to have the text of the citation handy...

Citation for the Nomination of Roy Bishop to receive the Chant Medal for 2001:

We are happy to nominate Dr. Roy Bishop to receive the Royal Astronomical Society of Canada's Chant Medal. We think that this award is particularly appropriate for this year, 2001, since Roy has just completed a nineteen year tenure as editor of the Observer's Handbook.

An amateur astronomer resident in Canada, Roy has completed work with the Observer's Handbook that is original enough to make him eminently qualified for the Chant Medal. During his tenure as editor, he oversaw an enormous growth in the size and quality of the Handbook. In particular, his essay on Orbital Motion, which has been revised over the last editions, reflects the thinking of a man who struggles for a deeper understanding of those physical principles which appear to govern us. Very few people have even attempted to explain gravitation in terms that the public can understand, and we believe that Roy's phenomenal attempt to do this has added significantly to the ability of many people to understand the world and universe in which they live. The orbital motion article is just one example of Roy's originality of thought: the sections he wrote on Optics and Observing, Telescope Parameters, Binocular Performance, Filters, and others, have allowed thousands of professional and amateur astronomers to understand these aspects of the heavens in greater depth.

For over 19 years the Observer's Handbook was a true labor of love from the writing desk at Maktomkus Observatory, a structure on the roof of his Avonport, Nova Scotia home. From this site he has conducted an observational program that has now stretched over three decades. His 16-inch telescope, which he designed himself, is a work of art as much as an accurate scientific tool. (See Sky and Telescope, May 1996, page 85)

In addition to his research directed toward the sky, Roy has done considerable research about the effects of celestial bodies on Earth—specifically the tides. From his home he can observe the ebb and flow of the tides of the Minas basin, whose range, which can exceed 50 feet, is the greatest on Earth. Among his popular writings, the pamphlet *The Bay of Fundy's Minas Basin: Highest Tides in the World* is an excellent popular essay on the subject of tides.

Dr. Bishop's research on important 18th and 19th century observatories in eastern Canada has led to their being recognized as important to the history of our country—observatories and people who otherwise would have been completely forgotten. His interest in the birthplace of Isaac Newton led to his visit to Woolsthorpe Manor, and to his taking of a unique photo of the house precisely at the time when a double rainbow arched over its roof. This was no accident, and the story is typical of the way Roy takes clever advantage of situations. With his wife Gertrude, he visited the house during a drizzle. After he drove off, he noticed clearing to the west and hurried back, hoping that he would catch the rainbow. His photograph appeared on British postage stamps and in many other places, a tribute both to a British physicist of a previous century and a Canadian astrophysicist who produced the remarkable photograph. Roy has also taken many remarkable photographs of eclipses, planetary alignments, atmospheric effects, and other testaments to the beauty of the sky.

A respected teacher, naturalist, physicist, and astronomer, and a remarkable human being, Roy Bishop is, in our opinion, precisely the kind of person, and has precisely the kind of achievements, that make him worthy of the Society's Chant medal, and we are honoured to so nominate him.

Leo Enright
David Levy

March Meeting Report

Paul Evans

RASC Halifax Centre's March meeting was brought to order at 8 P.M. by our President Mary Lou Whitehorne. After introducing herself and welcoming everyone, Mary Lou noticed that there appeared to be some new faces and promptly told the assembled audience the benefits of membership. Also noted during the introduction was the availability of items for purchase from 2nd Vice-President, Stephen Tancock. The Observing Chair, Dave Lane, was also pointed out as the contact to find out about observing lists.

With the normal pleasantries out of the way, Mary Lou introduced the main speaker, Father William Lonc. Father Lonc, is the Saint Mary's Emeritus Professor of Physics. He has a Ph D. in Solid State Physics and is working on the 2nd edition of his book on Radio Astronomy Projects. The title of Father Lonc's presentation was "The Galileo Affair – A Speeding Ticket Gone Sour".

The talk is based on two books: *The Galileo Affair – A Documentary History* by Maurice Finocchiaro, and *Galileo for Copernicanism and for the Church* by Annibale Fantoli.

Father Lonc addressed two basic events in the matter of Galileo and the Copernican model of the solar system. The first occurred in 1616, while in Rome, Galileo was summoned by Cardinal Bellarmine. During that meeting, Galileo was cautioned – even ordered – to avoid promoting the Copernican system. Galileo had been supporting the Copernican theory which has been around for some time (since 1590) and drew attention to it since he was a very prominent citizen. Relative to this event, Father Lonc introduced an analogy to a prominent citizen who is warned about speeding.

The second event occurred in 1633 when Galileo was charged with promoting Copernicanism in his book *Dialogue* in spite of his promise in 1616 in response to Bellarmine's orders. He denied the charges and even appears to have compromised himself in court. An 'out of court settlement' is rendered impossible by his denial of promoting Copernicanism, in spite of the contrary as found in his book. Relative to this event, Father Lonc extended the analogy of the prominent citizen brought to court for speeding. He is offered a small fine as a token punishment but decides instead to deny the charge thereby forcing the court to proceed with a full hearing which ultimately finds him guilty.

Father Lonc continued on to explain the pressures that existed upon Pope Urban the 8th. These included political pressures from Spain and Austria for favoring France, and the position of many Cardinals who were concerned about the lack of action against heresy in general.

At this point in time there some support for the Copernican model including by some clerics within the Vatican. However, no coercive proof existed due to the lack of observation of parallax.

In order to continue Father Lonc introduced an aside to discuss the nature of scientific discussion historically. Drawing examples from Aristotle, Father Lonc, illustrated that discourse on physics was based more upon discussion and argument rather than a mathematical or formulaic approach (the qualitative versus the quantitative). This tendency was still true during Galileo's time. However, Galileo had adopted greater use of the quantitative approach. This switch in approach garnered some fans, but it also ruffled some feathers. Some people turned to scripture to combat him. Father Lonc introduced as examples Psalm 19:14 which describes the rising and setting of the sun, and Joshua verse 13 which refers to the sun standing still. In response to certain scripture based criticism Galileo argued in *Letter to Christina* how the text could be interpreted and how it did not need to be interpreted literally.

This line of argument by Galileo was the last straw and detractors complained to the Church saying he was meddling with theology. This led to an inquisition that included debate of what a fact is (i.e. the difference between 'observation' and 'explanation').

To conclude the presentation Father Lonc turned to an experiment. He had previously set up a small circuit made up of a power source, and loops created with a resistor and a capacitor that had three volt meters at different points. With the help of audience assistance, Father Lonc illustrated that the sum of the voltage meters did not add up to what logic would suspect. The discrepancy is because of the phase angle *[meeting reporter reserves the right to avoid explanation of subject much too far back in his formal education]* and the nature of the measurement devices. If using oscilloscopes at any given instance the voltages would correctly add up – however due to the functioning of the voltage meter a discrepancy was observed.

Father Lonc concluded by connecting this experiment and the earlier speeding ticket analogies back to the matter of Galileo's position with the Church. There was the nature of the developing conflict between Galileo and the Church (the prominent citizen who was warned but ultimately denies speeding) and the nature of the debate which challenges observation and explanation in a time where observation could not fully prove the Copernican model of the Solar System. The talk concluded with enthusiastic applause followed by several questions.

The next part of the meeting was the awarding of the Burke Gaffney Award for the best article in Nova Notes during the previous year. This year's committee was made up of Michael

Gatto, Sergio Grbac, and Mary Lou Whitehorne. Mary Lou presented the 2002 Burke-Gaffney Award to David Chapman for his article title *The Sundial of Montegufoni* that appeared in the December 2001 issue of Nova Notes.

David was on hand to accept his award and there was some fun discussion of his eligibility for the award given his involvement with the revisions to the award rules!

After the normal break for refreshments and conversation that ended at 9:50 P.M., Dave Lane came forward in his role as National RASC Representative. Dave informed the audience that at the upcoming General Assembly there would be motions voted on to amend the society by-laws. The first motion is to allow remote participation at National Council meetings by electronic means. The second motion dealt with changing terms of officers. The third motion is to decouple fees between National Office and the Centres. It was the third motion that Dave wanted to focus on. Currently there is a 60/40 split of the membership fee between National and the centre a member is attached to. During previous discussions the identified pros of decoupling are more transparency in fees, and when national raise their fees it doesn't force centres to raise their fee as well (some centres have negative surcharges to refund a portion of a member's fees). The cons of the issue include increased administrative complexity of the centre's portion of the fee, in particular dealing with life members that transfer centres and require an additional charge or refund as well. Also, there is concern about encouraging unattached members who only join the National RASC. Dave concluded by reminding the members in the audience that he would have proxy voting forms available at the end of the meeting.

Dave Lane continued to the next part of the meeting by presenting What's Up, the regular meeting feature to discuss upcoming astronomical events. Dave began with simulating the path of Comet Ikeya-Zhang though the night sky using the software Earth Centered Universe. There was general discussion about good places people had gone to observe the comet including the St. Croix Observatory, Sackville Cemetery and Peggy's Cove. 8 P.M. was the recommended time to try and Dave provided printed charts of the comet's path.

Dave then moved to simulating and discussing the April alignment of the 5 brightest planets in the west. Dave concluded with a reminder of upcoming Members' Night at the St. Croix Observatory on Saturday, March 16th and Friday, April 12th.

The last segment of the meeting was handed over to Paul Heath with the monthly Observer's Handbook Talk. Paul's topic was Fireballs and referred attendees with Handbooks to page 208. Paul began by showing a photo taken by member Darren Talbot of a magnitude –13 Leonid fireball. There are important benefits of reporting fireball sightings including the possibility of finding the object. If rapid meteor recovery occurs it is possible to study short lived radioactive isotopes. Reports should be submitted to The Meteorites and Impacts Advisory Committee (MIAC). The MIAC maintains a web site for Canadian observers to report fireball sightings at `http://miac.uqac.uquebec.ca/MIAC/fireball.htm`. Reports can also be submitted by email to `fireball@mta.ca`.

Reports should attempt to include all the information outlined on page 208 of the Observer's Handbook. Paul focused on the observation of location. In particular, it is ideal if the location of the observer can be noted by exact longitude and latitude. Observation of the beginning and ending points of the fireball is also critical. This can be accomplished by noting positions relative to stars in the night sky. The combination of accurately reported observer location, time, and notes of beginning and end points in the night sky will result in an excellent report.

Dave Lane pointed out during discussion that Nova Scotia is not a good location for meteor recovery due to the amount of ocean and trees. The possibility of recovery is more likely on Western prairies. In fact, there have been camera networks established in the West to aid in the observing fireballs.

Paul concluded his handbook talk and Ian Anderson was selected for next month's report.

Mary Lou concluded the meeting at 10:45 P.M. with a reminder that next month's feature presenter will be Daryl Dewolfe speaking about Caroline Herschel.

April 2002 Meeting Report

Pat Kelly

Having filled in as acting president before, (Mary Lou Whitehorne was one of those who had been lured away from our wonderful April weather to do some real astronomy at Mauna Kea in Hawaii), I was quite prepared to host the meeting, but my biggest concern was the meeting's date of April 19th. With the Montreal Canadiens making an end-of-the-season charge to make the playoffs there was the distinct possibility that that evening might also coincide with a Montreal–Boston, or possibly a Montreal–Toronto hockey game. I had to call in a lot of favours and get the Montreal game moved to a different night!

The meetings main speaker, Daryl Dewolfe, was almost a no-show, having had shoulder surgery the morning before! I cannot recall a speaker at any other meeting who started with an ice-pack made from a bag of frozen mixed vegetables on his shoulder! One of the things that motivated Daryl to show up was the promise that I had made to him previously

that I would introduce him in Klingon. Dig out your Klingon–English dictionary, as I am not going to provide "subtitles" as I did at the meeting!

Human Daryl pep tera' Nova Scotia. je'ta' navmey DuSaQ puS. lengta' Europe tera' botlh je lengta'vis Qobbe'. ghaj qun Qot Dub nej chal. Qap cha'Dich Herschel qaD bep ghom loS'vatlh bep cha'SaD vaghvatlh. ll' Hotlhwl'Hlvje' muvnav Doq SuD batlh Kahless je.

The topic of Daryl's presentation was the life of Caroline Lucretia Herschel, the sister of William Herschel. She was born on March 16th, 1750. At least it was 1750 on the German calendar; it was 1751 on the British calendar; maybe David Chapman can clear that up at a future meeting. Her father, Isaac Herschel, encouraged his sons to train in mathematics, French, Latin, metaphysics, and music. Caroline would lie awake in the evenings listening to her father and brothers discuss mathematics and science. Caroline's mother saw no need for a girl to become educated, saying that it was Caroline's duty to take care of her brothers. Caroline was destined to become a virtual Cinderella.

Caroline's future was further hindered by two illnesses. At the age of four she contracted smallpox, sustaining a permanent injury to her left eye; six years later a bout with typhus stunted her growth. Her parents concluded that she would never marry being neither rich nor handsome.

In 1757 her brother William went to England to avoid military service in the Prussian army. For the next several years Caroline was under the dominance of her mother, as her father was away for long periods with the army. Caroline's mother was determined to eradicate any thoughts her daughter might have of improving herself. Caroline's duties lay in the kitchen and the parlour. She was taught the refinements of washing clothes and darning stockings for her brothers and dressmaking for clothes for her mother. For a period of time she was even forced to give up part of her bed to a servant employed by her family.

In 1772 William took her to live with him in Bath, England but only after paying his parents for a maid to replace Caroline. (She also had to knit two years worth of stockings to supply the family before she left!) She became her brother's housekeeper, even feeding him by hand while he worked on his telescopes. William gave Caroline voice lessons and trained her in mathematics. Despite having no formal education, Caroline had a deep-seeded desire for self-improvement. She learned English, began to sing and trained as a soprano. By age 28 (1778) she was singing solo parts in Handel's *Messiah*. She began singing professionally, but only when her brother conducted. Eventually, William decided that he needed her more as his housekeeper, so she gave up hopes of a career of her own.

Caroline began to help her brother in the manufacture of telescopes and to share his passion for astronomy. Among these tasks, she pounded the manure to make moulds for the telescope mirrors. (There is something that you do not see on a lot of resumés!) She spent long hours grinding and polishing the mirrors used in his early telescopes. Not only did William Herschel make a lot of telescopes, he had a chronic case of aperture fever. His forty-foot scope had a tube that was made of iron and the second mirror that he made for it weighed over a ton!

At the age of 32, Caroline became an apprentice astronomer to her brother. In addition to recording his observations, she was frequently needed to alter the lateral supports for the telescope while her brother observed. Once, while running through foot-deep snow to accomplish that task she fell on the mechanism, piercing her thigh with an iron part shaped like a butcher's meat hook. William did not send for a doctor so she treated herself!

By day Caroline would work on the data obtained the previous night. She carried out the lengthy calculations with remarkable accuracy. One interesting fact is that Caroline was unable to memorize multiplication tables. She carried a set of tables on a sheet of paper in her pocket when she worked. No error has ever been reported in her calculations.

When William was away from home Caroline was able to spend time with her own program of research. Her first accomplishment were the detection of 14 nebulae, including one of the companions of the Andromeda Galaxy. King George III awarded her an annual pension of fifty pounds during a period of history when it was rare for a woman to be recognized for scientific work. In 1782 William made her a small refracting telescope (f/27", 30X) which she used to sweep the sky for comets. On August 1st, 1786, Caroline discovered a comet; the first female astronomer to do so.

William married in 1788, and Caroline had to leave the household as her housekeeping services were no longer required. She was deeply hurt by that decision; destroying every page of her journal from this period in her life). She found lodgings nearby and trudged the half mile to her brother's home on clear dark nights to record observations for him at the base of the 40 foot telescope. Unfortunately he seemed to require that of her primarily during the winter months.

The period from 1788–1798 may have been the most productive of Caroline's astronomical career. She found seven more comets; a record for comet discoveries by a woman until the 1980s, when it was surpassed by Carolyn Shoemaker. As a deep sky observer she is credited with the identification and discovery of many objects that are well known to amateur astronomers including M48, M110, NGC 253 (the Silver Coin Galaxy), and NGC 891 (the beautiful edge-on galaxy in Andromeda). She also undertook the re-cataloging

of Flamsteed's stellar catalog in 1797. This took her 20 months. She then produced an index to Flamsteed's observations comprised of 561 observations which had been omitted. Two of the astronomical catalogues published by Caroline Herschel are still in use today.

She trained William's son, John Herschel (born 1792) in mathematics and astronomy. John Herschel spent long periods with his aunt during school vacations and was greatly influenced by her. When her brother died in 1821 (at an age of 76), Caroline finished her career as an observational astronomer and left England after having lived there for 50 years. She returned to Hanover and lived with her younger brother, Dietrich. She plunged into the task of compiling the immense amount of data she, her brother, and her nephew John had accumulated. Before her death, she catalogued every discovery that she and William had made. This became the Herschel 2500 list. She sent this to the scientific community in England. She was bestowed with the Gold Medal from the Astronomical Society for her Zone Catalogue of Nebulae. Germany honoured her as well–the King of Prussia gave her the Gold Medal of Science in 1846. Oddly, the French Academy of Science refused to give her any astronomical award on the basis that the Society members did not wish to be "accused of an excess of gallantry". Caroline Herschel lived to be nearly 98 years of age, passing away during the evening of January 9th, 1848. The church of her childhood, near her parents, is where she now rests. In 1889 a minor planet was named Lucretia in her honour.

Following the refreshment break, it was time for "What s Up", our monthly look at the celestial events that will be unfolding in the time before the next meeting. In Dave Lane's absence, Pat d'Entremont had volunteered to let us know what to look for. The first item on Pat's list was snow on Sunday! We had a preview of the planetary alignment, and were reminded that Jupiter was at the highest elevation it would reach for some time to come. Comet Ikeya–Zhang is now circumpolar, but no longer as impressive as it had been previously. It is moving from Cassiopeia into Cepheus. Next on the agenda were the two upcoming meteor showers, the Lyrids and the h Aquarids. Lastly, Pat reminded all of the galaxy fanatics that the Virgo Cluster was now open for business.

The last event for the evening was the handbook talk. Ian Anderson had decided to speak about the section of the Table of Precession, which appears on page 33 of the current handbook. He had noticed that in the three previous handbooks, the table had been found on pages 29, 29, and 26, and that perhaps next year's handbook should include a section on the precession of the precession table!

Ian started off by asking the question: "What is the right ascension and declination of the North Ecliptic Pole?". Eventually the audience determined that the right ascension was 18 hours, and the declination was +66.5˚. Ian followed this answer with another question: "What about in 1,000 years?". The answer is the same! You also arrive at the same answer if you check the coordinates from 1,000 years ago.

For those in the audience who had no idea what he was talking about, Ian put up a star chart of the area round the North Celestial Pole. He only indicated the position of the pole over the course of recorded human history, which only completes about one-sixth of a circle. He then showed a copy of the table from the handbook, lamenting that they had made it look more confusing than it really was, as it combined two sets of "lookup tables" in one. He pointed out the there were three lines where the correction had a constant value of 2.56, one row across the top of the table, another row across the middle of the table, and the rightmost column of the table. He also showed that the point where the precession in both R.A. and Dec. was zero was in the bottom row of the table, corresponding to 18 hours, +66.5˚. He also noted that this table could only be used for a 50-year period and that you could not calculate positions 500 years in the future by multiplying the corrections on the table by a factor of ten!

He finished off with a series of questions about precession:
"Does the precessional path of the North Celestial Pole follow a circle?" Probably not. Humans have only been able to follow its path accurately for a small fraction of a circle. The path could be an inward spiral, outward spiral or the type of circle that children draw (where they go around several times and do not quite go over the same path twice).

Is the 23.5˚ tilt of the Earth's axis a constant? Again, "Probably not." as the Earth is mostly liquid and prone to large scale "redistributions" of its internal mass. It is also prone to redistributions of the water and ice on its surface. In 1920, the Russian scientist Milankovitch calculated that ice ages over the last 41,000 years could have changed angle of the Earth's axis by 2.4˚.

I know that I, and hopefully a lot of other people in the audience, now think about precession in a new way.✯

Additional digital picture from Graeme Hill.

Nova East 2002

Nova East Etiquette

To make Nova East an enjoyable and safe experience for everyone, we would appreciate your co-operation in following these Star Party rules of etiquette:

1. RED LIGHTS AT NIGHT
White lights ruin our night vision and our ability to see the night sky. Please cover flashlights and/or car lights with a red filter. Please don't operate a naphtha or propane lantern on the site after dark.

2. CARS AT NIGHT
For Nova East campers, please don't move on site vehicles at night. Better yet, move your vehicle to the nearby non-camping parking area ahead of time for an easy departure. Parking for non-camping Nova East attendees is available inside the Park near the observing site. Check at the Nova East Information Tent for directions.

3. PETS and VALUABLES
Park rules require pets to be kept on a leash. Please protect your valuables as Nova East is not responsible for lost or stolen articles. However, Park staff, and selected Nova East personnel, have been assigned to ensure site security.

4. ALCOHOLIC BEVERAGES
No alcoholic beverages are allowed to be consumed on site.

5. PLEASE FOLLOW ALL PARK RULES
A copy of park rules is available at the park entrance.

Smiley's Provincial Park
Hants County, Nova Scotia
August 9th & 10th

The Royal Astronomical Society of Canada, Halifax Centre, The Minas Astronomy Group, and **The Nova Central Astronomy Club** present

The 16th Annual Atlantic Region Star Party
August 9th and 10th, 2002
Smiley's Provincial Park Hants County Nova Scotia

Bringing the stars to the public is a legacy of every Nova East Star Party. To that end, Nova East 2002 is offering a wide selection of "sidewalk astronomy" events on Saturday, August 10th, 2002, which are open to the general public, Nova East attendees, and Smiley's Park users. They include a **Solar Observing** session, a **What's Up?** talk followed by a **Night Sky Observing Session** with telescopes, and other impromptu events to be announced on site. In addition, Nova East registrants have access to an evening Astro-Talk by a special guest speaker, Solar observing, Astronomers' Breakfast, Astronomy Workshop(s), two evening group Observing Sessions, and even a gameshow! Plus the chance to win some neat door prize draws. Nova East Registrants have on site parking (if Camping) or adjacent site parking (if non-Camper). Otherwise, parking is at the Park Entrance.

Pre-Registration

You are urged to pre-register by mail before **July 19, 2002.** Please complete and return the included registration form, with payment, to the indicated address. We will confirm your registration by post or e-mail if your payment is received by **July 19, 2002.** Pre-registration allows Nova East day-users vehicle parking adjacent to the Nova East observing site for easy access and equipment unloading, as opposed to parking at the Park entrance. It also guarantees Nova East campers a campsite adjacent to the observing area. (see "Campsite Reservation Information") It also ensures your name is included in our door prize draws. Pre-registration is extremely helpful for Nova East organizers and the Park staff, to ensure adequate on-site facilities such as picnic tables, garbage cans, etc. and to estimate potential numbers attending Nova East programs.

To contact Nova East 2002

Visit our Website:
http://halifax.rasc.ca/ne/
E-mail us: novaeast@rasc.ca

Campsite Reservation Information

This is a camping week-end so we encourage everyone to bring their tent or trailer. We have camp sites available adjacent to the observing site. To guarantee one of these sites it would be best to pre-register. All Nova East campers pay for and register their campsite with us - **do not register at the Park entrance.** Specific campsites will be assigned upon checking in at the Nova East Information Tent at the Nova East site in the Park. One vehicle per site. Non-camping vehicles are not permitted in the Nova East campers area. Nearby vehicle parking is available.

Promotional Items

A limited supply of Nova East T-shirts will be available at the star party. To avoid disappointment, it would be best to pre-order your Nova East 2002 T-shirt with your pre-registration. Your T-shirt will be then be waiting for you upon arrival at the Nova East Information Tent. There will be no orders after the July 15, 2002 pre-registration deadline.

Registration Form

Name: _____

Street or P.O. Box #: _____

City: _____

Province: _____

Postal Code: _____

Telephone #: _____

E-mail Address: _____

Registration Fee

Attendance
$15.00 for Weekend (Single or Family attending)

Camping

Total

☐ Nights X $18.00/night = ☐

One vehicle and one tent/trailer permitted per site

T-Shirts
All T-Shirts are $15.00. Please indicate the number of each size you will need.

XXL	XL	LG	MD	SM		Total
☐	+ ☐	+ ☐	+ ☐	+ ☐	= ☐ x 15.00 =	☐

Please return this form to this address by
July 19, 2002, *with a cheque payable to* **RASC, Halifax Centre.**

Nova East 2002
c/o Dave Parsons
485 Basinview Drive
Bedford NS
B4A 1T3

Nova East 2002 Program

(for Registrants and Pre-Registrants)

Friday, August 9th, 2002

Afternoon to Early Evening	*Registration (at the Information Tent)*
8:00 P.M.	*Nova East Guest Speaker* *Robert Hawkes* *"The Leonid Meteors: what do we know now?"*
9:30 P.M. to ???	*Nova East Observing Session*

Saturday, August 10th, 2002

9:00 A.M.	*Astronomers' Breakfast / Group Photo*
11:00 A.M.	*Viewing Our Home Star (Public Invited)*
1:00 P.M.	*To be determined*
4:00 P.M.	*Astronomy Workshops*
7:00 P.M.	*Door Prizes and Group Photo*
8:00 P.M.	*Game Show: Who wants to be a GAZER? (Public Invited)*
9:00 P.M.	*What's Up? (Public Invited)*
9:30 P.M. to 10:30 P.M.	*The Night Sky Through a Telescope (Public Invited)*
10:30 P.M. to ???	*Nova East Observing Session*

**Upon arrival check at the Nova East Information Tent for the start time of a specific program and last minute additions.*

Sunday, August 11th, 2002

For some, this will be the departure day, but people are welcome to stay for an informal, unplanned day. We will conduct tours to the nearby St Croix Observatory for those who would like to see it. Traditionally, at previous Star Parties, some of the astronomers have always stayed for Sunday night observing. Nova East campers are welcome to stay another night on your site. *(camping fee payable to the Park Office).*

Smiley's Park and Local Services

Smiley's Park Facilities

In the Park, over 100 campsites are available to the general public. Hot showers and flush toilets are at the main comfort station. Water, fire grills, picnic tables, a trailer dump station, and facilities for the disabled are also available. Firewood can also be purchased.

Local Services

Gas stations, Camping Supplies, Confectionary goods, and Hardware supplies are 5min. from Smiley's Park in the village of Brooklyn. Extensive services such as Malls, Restaurants, Banking, and 24hr services are in the town of Windsor, 15min. from the Park. The closest motel (but not the only one) is the Downeast Motel, 902-798-8374, also 15min. drive from the Park.

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

Fri. July 5th

(rain date Sat. 6th)

No Members' Night for August due to Nova East, August 9-10

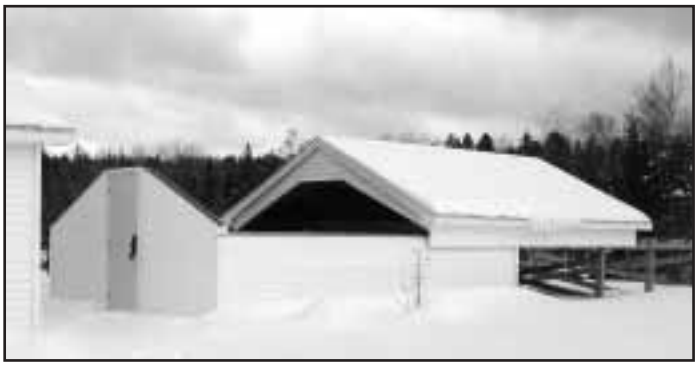
Directions from Halifax

(from Bayers Road Shopping Centre)

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

Become a St. Croix Key Holder

For a modest key fee, members in good standing for more than a year who have been briefed on observatory can gain access to the St.Croix facility. For more information on becoming a key holder, contact the Observing Chairman Dave Lane at 826-7956.



The Saint Croix Observatory–it's a little warmer there this time of year.

Adventures at the SCO.

We had a great turnout for Members' Night last night! At one point there were at least 24 people there at once, and I estimate that between 30 and 34 people total were there at some point in the evening. I cannot recall a previous time when the roll-off roof was standing-room only, with much spill-over surrounding the main building. There were many great conversations and trying out of each others' telescopes and eyepieces. I think the center of attention was the new 17" telescope that Steve Tancock recently finished building. There was a steady line up to experience the views of galaxies, Comet Ikea-Zhang, the Ring Nebula, Sombrero Galaxy and more, with everyone patiently (at least on the outside!) waiting their turn. At one point around 10:30P.M., I commented that there was supposed to be a chance of an aurora that evening. Someone looked north and shouted "There it is!" There were large, dancing, sharply-defined beams of green light tinged with pink at the tips shooting up to the Northern bears, and it extended from the NE to NW. It lasted for perhaps 20 minutes to half an hour. The evening was punctuated with several bright meteors streaking across the dark sky from random directions.

Most people left by midnight, but there were at least six die-hards who stayed until close to 2:00A.M. We started to get silly with the big scope and the Sombrero, jacking the magnification up and up and up. Most comments on the views, especially from me, were exclamations on the order of "Ho-leee $#!+!!!." Even at high magnification in the "Nah-gler" eyepieces, the images were sharp, with Paul Heath. commenting on the detail he could see in the dust lane. I wanted to stay later, but my toes and finger-tips were numb. With many, many thanks to Keith Lowe, and Dave Lane, I bagged and took notes on at least 8 Messier objects and 12 NGC's. My sincere thanks to the membership for making this the best Members' Night that I've attended. We have a vibrant, enthusiastic club that is very welcoming towards newcomers and the curious. It has certainly made my entry into observational astronomy a pure delight.

– Craig Levine

Meeting Announcements

Halifax Centre of the Royal Astronomical Society of Canada

June 21

"Who wants to be a GAZER" by Pat Kelly

You could be one of the lucky contestants selected from the studio audience! See how many astronomical questions you can answer as you go for the big prize, but don't use up your lifelines too quickly!

Patrick Kelly is the Halifax Centre's First Vice-President. He has taught first-year astronomy courses at Saint Mary's University and Acadia University, as well as for Continuing Education programs in the Halifax area. He moved to the Windsor area ten years ago to escape the light pollution of the Halifax metro area, and tries to do some observing whenever the maritime weather permits. When not pursuing astronomical interests, he can be found at the Dalhousie University's Faculty of Architecture and Planning keeping the computers (and their users) happy, or waiting patiently for the Montreal Canadiens to win their next Stanley Cup.

The Halifax Centre of the RASC does not hold regular meetings during the months of July and August, watch for details on September's meeting next Nova Notes!

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

Members of the general public are welcome.

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

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

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

Halifax RASC Executive 2002

Honorary President	Dr. Roy Bishop	
President	Mary Lou Whitehorne	865-0235
1st vice-president	Pat Kelly	798-3329
2nd vice-president	Steve Tancock	465-4092
Secretary	Craig Levine	852-1245
Treasurer	Paul Evans	423-4746
Nova Notes Editor	Michael Gatto	453-5486
National Representative	David Lane	826-7956
Librarian	Dr. Michael Falk	422-5173
Observing Chairman	Dave Lane	826-7956
Councilor	Clint Shannon	889-2426
Councilor	Dave Chapman	463-9103
Councilor	John Jarvo	897-0529

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