

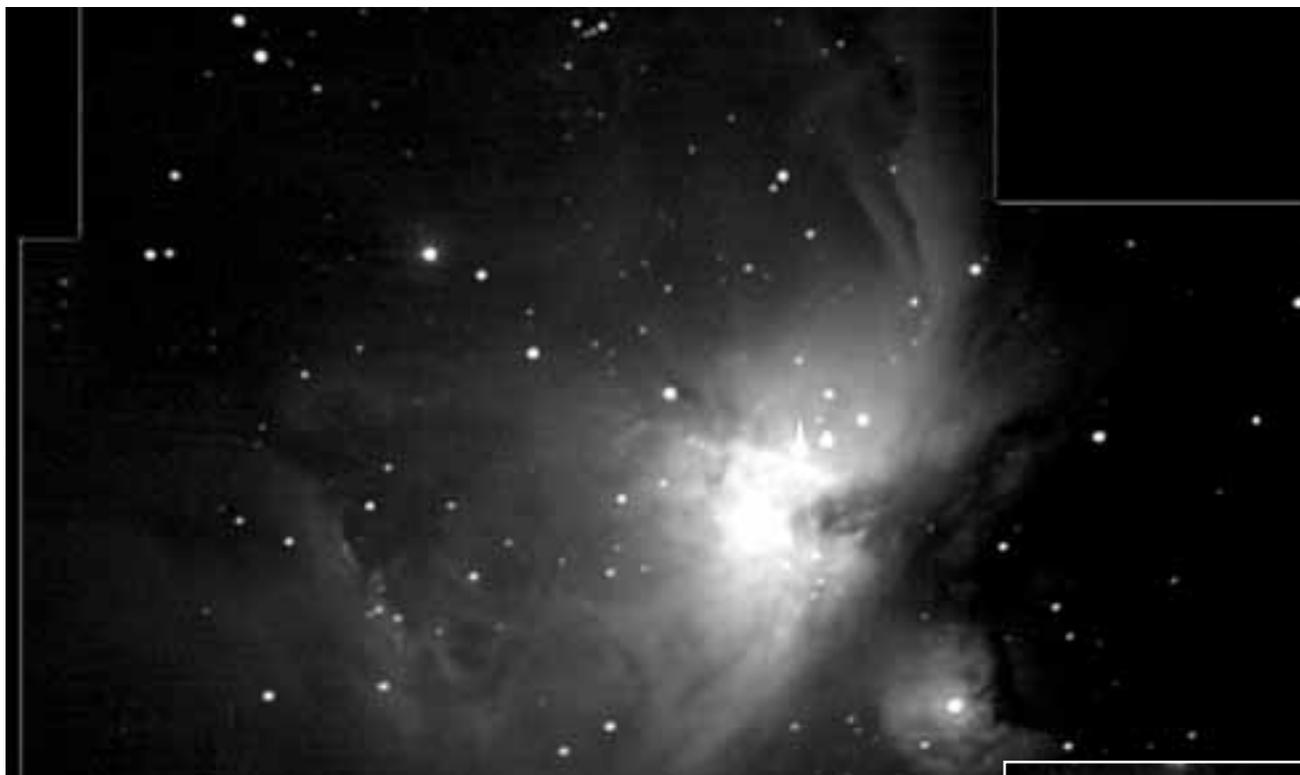
Nova Notes

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



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Astrophoto of the Month *M42 and the Horsehead*

The Horsehead is the sum of 3 three-minute shots at f4 while the M42 mosaic is made up of 3 frames of 3 shots, thirty seconds each. – Blair MacDonald

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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!

After a pretty long run of cloudy observing windows, the weather began to cooperate in time for members to observe the evening comet Ikeya-Zhang.

Halifax RASCals: Comet Ikeya-Zhang

There are already naked eye reports coming in for this comet from those in more favourable geographic areas. Also reports of a bright tail, greenish colour, very bright and condensed core could make this an interesting object in the months to come. Its perihelion is March 18 and Sky & Telescope is predicting maximum brightness from March 22 – March 28 at Mag 3.4. It will be best for us from the last week of April through May. You'll need an unobstructed view of the NE horizon to see it in late April but it will be getting but much higher (though fainter) in the sky in May and even June.

I'm not sure but with some luck we might even be able to start seeing it anytime now. It will be about 12° above the Western horizon tonight just as astronomical twilight sets in, about 16° directly below Mars.

- Keith Lowe
(keith42@accesswave.ca)

Halifax RASCals: Comet Ikeya-Zhang

I saw the comet tonight in the city murk from the grounds of Dartmouth High School. It was bright enough to punch through, but I could tell it was a comet (not a star) as the coma was quite large.

I even saw some suggestion of a tail pointing away from the Sun. Must be very nice in a dark sky!

- David M.F. Chapman
(dave.chapman@ns.sympatico.ca)

Halifax RASCals: Comet Ikeya-Zhang

From Avonport Monday evening the comet displayed (in binoculars) a narrow, 2°, slightly-curved tail and was about magnitude 4.5. It is the best comet since Hale-Bopp. It reminds me of Hyakutake, except it is about 10 times as distant and hence 5 magnitudes fainter with a tail having an apparent length 10 times shorter.

- Roy Bishop
(rg@ns.sympatico.ca)

Halifax RASCals: Comet Ikeya-Zhang

I saw Ikeya-Zhang last night from the hill-top of the big, dark, cemetery on the west edge of Sackville. Very nice, miniature version of Hyakutake – about 3° of tail with a faintly blue coma. I put it at about mag 4 – very similar in brightness to the central part of M31.

- Mary Lou Whitehorne
(ml.whitehorne@stmarys.ca)

Halifax RASCals: Comet Ikeya-Zhang

Well, I just had my first look at the new comet from the site of my future observatory—errrrrr—living quarters (we closed

on our new lot a couple of weeks ago and signed on the dotted line for the house construction earlier this evening). It was quite easy naked eye and very nice in the binos sporting a 2-3 degree tail. Michelle was even impressed—it being her first comet.

PS: see, told ya I was getting my dome :-)

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

Halifax RASCals: Comet Ikeya-Zhang

Yes, about as bright as eta (η) Piscium (mag 3.6), visible to the unaided eye, with a compact bright & bluish coma, and with a pretty 2-degree tail. A lovely sight in binoculars. It has brightened by more than a magnitude in the past week and the tail seems to be wider. In view of the weather predicted for the weekend, tonight (Thursday) was likely our last good view of the comet until the end of the month when the Moon gets out of the evening sky.

- Roy Bishop
(rg@ns.sympatico.ca)

Halifax RASCals: Comet Ikeya-Zhang

Sunday evening, as I saw it in binoculars, the comet was near magnitude 3.0 and with a 4-degree tail. Had the Moon not been nearby, the visible tail would likely have been longer.

- Roy Bishop (rg@ns.sympatico.ca)



Nova Notes

The Newsletter of the
Halifax Centre of the RASC

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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 May 24

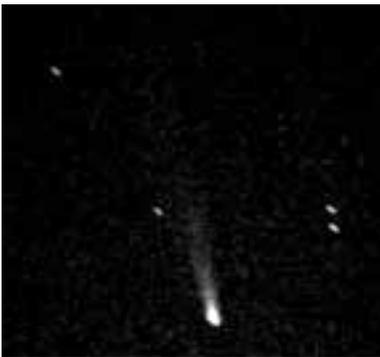
eyes Up!

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.

Michael Boschat—Comet

Ikeya-Zhang Photo



Hello All

Well, once again it was clear and I can't believe I had another headache! I wonder if the comet is responsible, better check with my "astrologer" :o

In any event, I biked down to Dal and set-up on the roof, I decided to take my camera and 200mm telephoto (note 200) I waited 'til about 7:30 P.M. and I could just see Ikeya-Zhang naked-eye. In my 20x60 binos it was a nice blue color with a tail almost the field diameter (about 4 degrees). It looked like the coma area was slightly coma (,) shaped? To me anyways, that sort of caught my eye.

So now I decided to take some photos, out comes my trusty Zenit camera and my 135 telephoto ... WHAT!? I put the wrong one in my knapsack!

I just sat there. I know I grabbed my 200mm! I was not a happy camper. I shot a few images between 10 and 30 seconds on Kodak Gold (see above) and each time I looked in the viewfinder I could see the "small" image. As Homer Simpson would say D'OH!

Roy Bishop—Saturn Occultation

I started observing this evening somewhat after 20:02 20 02 2002. From Avonport the mid-point of the start of the Saturn occultation occurred at approximately 20:47:30 AST. According to the program "Starry Night" the midpoint as Saturn was being covered should have been about 15 seconds earlier, so this program is remarkably accurate!

It took about 2 minutes for the Moon to cover Saturn. I had hoped to time this to the nearest second but thin cloud interfered. The end of the occultation was obscured by cloud, although I did see Saturn near the bright lunar limb about 3 minutes after the occultation had ended.

The next event of interest occurs during the hour following 2002 2 22 22:20:02 (another palindromic moment) as the Moon glides past Jupiter that evening.

Craig Levine – Observations of Comet Ikeya-Zhang

I went out at dusk and after a few minutes of dark adaptation, it was an easy naked-eye object, with the tail visible. In 7x50 binoculars it was a truly beautiful sight. My telescope was set up on my South-facing deck, so I didn't get a chance to see if the SWAN band filter would bring out more of the tail. Next time. I agree with Roy's email posting that this is the most spectacular comet since Hale-Bopp.

As an aside, am I remembering correctly that there was a 30-40 year period in the 20th century (it still feels odd referring to it in the past-tense) where there were no comets seen? (*see next article*)

The sky was very generous last night. In the two and a bit hours I stayed out before crashing for the night, I observed four planetary nebulae, six open clusters (and added 3 more Messiers to my tally), a bright meteor streaking from Leo towards the direction of Sirius, and two galaxies. I slept deeply last night, as I always do after an observing session.

Roy Bishop—Comet History

The period you refer to was 1910 - 1957. There were two bright comets in 1910 and two in 1957. I saw the 1957 comets (Arend-Roland and Mrkos) but 1910 was before even my time! There may have been a comet or two as good as Ikeya-Zhang between 1910 and 1957 but, for what it is worth, there is no record of such on the hard disk between my ears. The longest period without a "great comet" in my experience was 20 years, 1976 to 1996, between Comet West and Comet Hyakutake. I wonder why West, Hyakutake, Hale-Bopp, and now Ikeya-Zhang have all appeared brightly in March skies?

Keith Lowe—A Fortnight of Comets

An old friend C/2000 WM1 (LINEAR) from last November is now rising above the horizon in the pre-dawn hours. It is being reported about 8.5 mag right now but will continue to fade over the next couple of months. It makes it the 4th comet readily visible for us right now, brighter than 11 Mag. I've noticed that for the period between April 7th – April 20th, these 4 comets could be viewed in one night!

C/2000 WM1 (LINEAR) will be travelling from Aquila into Hercules during that date range. Ikeya-Zhang should still be a naked eye object at least for the early part. C/2002 E2 (Snyder-Murakami) will be approx 10-10.5 mag. and travelling between Lyra and Cygnus. C/2001 OG108 (LONEOS) should also be around 10 - 11 mag I believe but will be close (frustratingly close for us Newtonian owners) to the Zenith, especially between the 7th and 10th.

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

Email dlane@ap.stmarys.ca

Phone 902.826.7956

or

Nova Notes Editor

Email michael@allura.com

Phone 902.453.5486

January 2002 Meeting Report

Ian Anderson

RASC Halifax Centre's January meeting was the first for Mary Lou Whitehorne returning as president for one year only! Her arm has healed only recently from a horrible twist she received from members who were unable to find a suitable pilot to manage the controls, but she insists she is in the pilot's seat for one term only this time and warns us not to let the grass grow under our feet concerning finding a replacement!

The meeting began shortly after 8 P.M. to full attendance with the customary enumeration of membership benefits, and a general invitation for new members and those considering joining to talk to any one of us seasoned veterans. Then the floor was turned over promptly for David Chapman's presentation: "A Date with the Stars: the Astronomical Basis of Our Calendar."

David first dedicated his presentation in memoriam to F. Graham Millar who left us last year. Then came an outline of the presentation along with a helpful bibliography, and a few thoughts as to why mankind keeps track of the passing of time in the first place. A lifetime of 30,000 days needs to be broken up into larger pieces to be made sense of.

Our first natural or obvious unit of time measurement other than the day is that period of roughly one month between full moons; properly called the synodic month which is on average 29.530589 days. But this is an untidy period.

The week has almost universal recognition as having seven days, but it is not an obvious astronomical period except in being roughly the time between quarterly moon phases. This in itself seems ample justification. Humans think naturally in small

numbers – in threes and fours. Seven is near the outside limit of comfort, and it is a convenient grouping of days and division of the month.

The year is clearly a natural period, and important to man who determines his activities according to the annual cycle. Specifically, we are concerned with the tropical year which is the period between the seasons, or precisely between vernal equinoxes (or Summer Solstices) measured as 365.24219 days.

Dave illustrated that the widely accepted tropical year as being the basis of long term time measurement is not unanimously subscribed to by all of the world's cultures. The Moslems have a lunar-based calendar whose "year" is about 354 days long, which means their months start about eleven days earlier each seasonal year, and their year count is out of sync with ours.

Thus, the Holy month of Ramadan, their ninth month began in 2001 on November 17th. In 2002, Ramadan begins November 6th. The Moslem New Year 1423, the 1st of Muharram begins about March 14th 2002. In about 33 years the Moslem calendar will begin again roughly in middle March as it does in 2002. (This calendar commenced in 622 AD, the year of the Hegira. 1380 tropical years have elapsed since this event. But the Moslem Calendar is now finishing its 1422nd "year". This is explained by the fraction $354.3/365.24$. Their year is 3% shorter than ours. They do not count seasonal years the way we do.)

The Hebrew and Chinese calendars are a cross between lunar and solar based reckoning. It was observed that in every 19 years, or 235 synodic months the moon comes within a couple of hours of repeating its course on our solar based calendar. Pull out the Handbook for 1983 and see how closely the quarterly moon phases coincide with this year's. Meton, a Greek astronomer of the 5th Century BC discovered that in a series of 19 years, 12 years containing 12

months, and 7 years of 13 months could be made to fit the lunar cycle. He devised a cycle where the first two years are 12 months long, the third is thirteen months. The fourth and fifth are 12, the sixth is 13 etc.

It was the flooding of the Nile river by its tributaries every August that was of chief concern to the agrarian people of Egypt many centuries BC. After the flood waters subsided by September the otherwise arid flood plain was ready for crop planting by the ancient Egyptians, so their focus on the seasonal year rather than the phase of the moon was solely important to them. The heliacal rising of Sirius (shortly after the Summer solstice) heralded the beginning of the flooding season of July and August. They were satisfied that the year was 365 days long, and it is believed the Egyptian calendar year stood for centuries, shifting in and out of sync with the seasons on a cycle of 1508 tropical years.

At Rome's founding in the eighth century BC it is said that Romulus devised a ten month calendar year beginning in March. The original names were: Martius (honouring the God of War), Aprilis (in honour of Spring or opening), Maius (the Goddess of fields), Junius (protector of marriage), Quintilis, Sextilis, Septembris, Octobris, Novembris, and Decembris (the fifth through tenth months). The lengths of these months were irregular, possibly averaging 36 days, but nothing was standardized.

By 46 BC, Julius Caesar tried to rectify the wandering mess, and with the help of an Egyptian astronomer, he adjusted the calendar to a leap year system every four years. He inserted two "leap" months for that year only, added two new permanent months: January and February, renamed the fifth month after himself, and proposed that the year begin in January, and possibly changed the length of each month. (Not to be outdone, Augustus Caesar renamed the following month after himself a generation later, stealing another day from February so that

August would have 31 days like July). This, the Julian Calendar, is still used unrevised by the Eastern Orthodox Church today.

The first Christian Ruler of Rome, Emperor Flavius Constantine, himself a hybrid of both pagan and Christian faiths, proclaimed in 325 AD the time of Christ's birth to nearly coincide with the pagan Yule and winter solstice, and it was not until 336 AD that Christmas was widely celebrated. The fusion of ancient pagan traditions and rituals with the holy and religious ones which we associate with Christmas today probably had their origins at that time.

Dave then came forward over a thousand years to the 16th century when Pope Gregory re-adjusted the calendar to put it back into sync with the tropical year, as under Julius's system, the calendar year had wandered off by ten days. October 1582 was severely eviscerated: Thursday October 4th was immediately followed by Friday October 15th.

The night's presentation touched upon the complexities of Easter calculations and Church holidays in both the Gregorian and Julian based calendars, on the pagan festivals of the cross quarter and eighth days, and some discussions on the Chinese and Jewish calendars and moveable feasts.

After a 20 minute break ending near 10 P.M., Andrea Misner gave the handbook talk on the topic of Auroras; (Pages 94-98 in this year's Observer's Handbook). The chart showing the 11 year periodicity of Solar activity since the 1940s was reproduced from page 94 and shown overhead, as well as the sketches of typical aurora patterns depicted on page 97. Andrea also illustrated the effect of the Van Allen radiation belts.

The presentation turned to the topic of possible aural phenomena connected with aurora displays, and concluded with the admission that the research

is still inconclusive on this matter.

Dave Lane followed with a few brief notes on coming astronomical events including a number of occultations of Jupiter and Saturn by the moon, and an upcoming members' night at the observatory at St. Croix. Members who are interested in observing at St. Croix are reminded that there is an ongoing list on the e-mail which shows who is planning to go to the observatory. And the new furnace is working wonders to make the warm room a cosy place in the coldest of winter nights.

Most importantly, Dave's account of Venus was both complete and concise: Venus is not visible this month!

Finally a word about the February meeting featuring a presentation by current secretary Craig Levine on globular clusters. The meeting was adjourned at 10:27 P.M. ✨

Messier Marathon

John Jarvo

Hi all,

The Nova Central Astronomy Club has been trying to get a Messier Marathon going for the past three years. This was our third attempt and we were all set to go for the weekend. It was Thursday, March 14, about 4:45 when I got home from work only to find the weekend weather predictions a washout. The skies outside were perfect. Of course it was Thursday, just like what happened last year, and the year before that.

Time to take this thing by the ears I said. I called MacNewt (Daryl Dewolfe) and the other local observers advising them that the search was on. I called my supervisor and booked the following day off. Daryl arrived at 7:00 P.M.

after a wild car ride across the province.

We first attempted to get the 20 hour Moon. Good try, but the seeing was just too soft and by 7:30 we gave up. A quick search gave us the Comet (Ikeya-Zhang) however, glorious in the early evening sky, sporting a gorgeous long tail. Looks like a smaller version of Hale Bopp. I noted to Daryl that anyone looking at it would surely recognize it for what it was as it set there in the sky looking exactly like what everyone would expect a comet to look like.

We next beat it back to my observatory, that which my wife fondly calls John's Shed, and set off on our Messier Excursion. Now for the purists among you, you may wish to leave at this time—this was not to be a traditional Messier Hunt. The one where you kill yourself trying desperately to get as many of the not so elusive objects between dusk and dawn. Nary a minute to look at it you'd say, there's many to come before the Sun breaks over the hills. And at the end of it all one hears things like I got 103 but I don't remember seeing them. I've done it that way and it is indeed a challenge to do and I take nothing away from those who choose to do it that way, congrats to you all.

Times change and where the dobs used to outnumber the computerized scopes by a hardy margin, I would suggest that's not the case anymore. Many of you now have these new "go-to" critters. That led me to think about a new type of Messier Marathon, one where you could attempt to not only check off all the Messiers but one where you might actually take your time and get a good look at as many of the objects that "your scope could find". I also wanted to see just how many I could get from my light polluted back yard.

We started a little late, ie about 8:15 due to the Comet, and lost M77, and M74 as they had slipped beneath my

Western horizon. M52 in Cass would require a return trip to get it at 3:42 A.M. By 9:00 we were looking for M70 in Lepus. The computer found it in the west wall of my observatory. Next time it goes to the top of the list. Too bad the telescope doesn't have x-ray vision enabling it to look through wooden walls.

We set off again and made it all the way to M100 by 11:57, when the cold and our stomachs insisted it was time for our first break of the night. Our count was 47 of 51 attempted.

Pizza and hot coffee were gone come 1:00 so we were back at it. By 2:45 another 25 objects had received our attention, bringing the count to 72. Another break. By this time people are getting tired so it was more warm and rest and a little food.

3:30 saw us out to finish the task. At 4:58 another 24 objects had joined our list giving us 96. M6, M7, M5 in Sgr, M3 in Aqr, and M30 in Cap were not observed, mostly due to the local horizons and the southern wall of my observatory. Again X-ray vision or a good chain saw were not available for this outing.

I know that this was not the traditional Messier Hunt, but I also know that we had a great time looking at and discussing object after beautiful object. It was a night that I will long remember, with discussions on the differences in each and every open and globular cluster that we all observed, the differences between spiral and elliptical galaxies, and whether certain galaxies were an Sb type or an Sa type.

The night left time for a good look at Jupiter and Saturn as well as some NGC's along the way.

My thanks first to my former "Night Shift Buddy" Daryl, In the early part of the journey we were joined by Roger Langille and Reg Henderson. At 1 o'clock Eric McNutt joined us and we three kept at it 'til the Sun drove us to our beds.

I encourage all of you with computerized scopes to get out there and take a long look this time at all the marvels that the Messiers put before you.

From Truro ... all the best.

John ★

Space Audio

Andrea Misner

Striking Earth's atmosphere, the solar wind slides over the Milky Way, burning the sky and capturing our imaginations. One aspect that I have found most intriguing about these majestic Auroras, is the debate of whether or not they actually produce sound. Tales go back centuries of people from the North hearing a swishing, hissing, or crackling sound. The level of pitch was said to change as the Aurora brightened and dimmed. Even today, reports come in claiming to hear this strange phenomenon. Conflicting with this is the fact that Auroras occur about 100 km (60 miles) up, thus creating a very long delay between the sound and movement. Moreover, the gas composing the Aurora is very thin, so the air between the display and the observer is too thin to carry sound waves. One explanation is, the sounds are generated within the observer's head. No, they are not all crazy, it's simply when they see the Aurora, electrical impulses from the eye leak into parts of the brain that produce sound. Often, when people are subjected to an environment that has little to no audio, the brain will "play tricks", creating noise when there is really none. This interpretation was tested by some early explorers who found when the eyes were covered the sounds disappeared.

The second sound connected to Aurora's, crackling, like electricity, is possibly explained by their strong electric and magnetic fields. New work has shown that fluxing magnetic qualities engender plasma discharges

in nearby sharp objects, pine needles, for example, which results in faint crackles. Furthermore, there have been cases where power fluctuations in long transmission lines have occurred, circuit breakers tripped, and transformers blown during fierce Aurora displays. Unfortunately, there is no solid scientific evidence that supports any of this.

There is a flip side to this, however. Something called Natural Radio may hold the key to unraveling the mysteries of Auroras. Unlike sound waves, which are vibrations of air molecules, natural radio is natural occurring electromagnetic signals originating from the Earth's magnetic field, lightning storms and of course, the Northern and Southern lights. Natural radio is vibrations of electric and magnetic energy, (electromagnetic waves). Additionally, it's known that Auroras produce radiation in the ELF/VLF region of the electromagnetic spectrum, which lies right in the audio range of the acoustic spectrum! This phenomenon becomes even more intriguing, when these ELF/VLF signals are put back through an audio amplifier and are converted into sound waves, they favour the sounds reported from observers while viewing an Aurora.

Experiments still go on today, however, yielding no great results. Even with all the scientific knowledge we have achieved over the decades, Nature's little mysteries lie as far away from us as our atmosphere. Anyone who has ever seen a grand Aurora sweep across the night sky will not soon forget the sight.

References:

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Gurrett, Dr. Donald A. Polar Plasma Wave Investigation. 2001 Available: www-pw.physics.uiowa.edu/plasma-wave/istp/polar/home.html
★

The Burke-Gaffney Award

Mary Lou Whitehorne

The Halifax Centre gives an award annually to the best article to appear in the previous year's volume of Nova Notes. Last year there were several good articles that were in the running and the judging panel spent more time than usual in determining the 2002 winner.

The 2002 Burke-Gaffney Award winner is David Chapman, for his article titled "The Sundial at Montegufoni", that appeared in the December 2001 issue. Congratulations, David!

I would like to encourage all members of the Halifax Centre to write an article about some aspect of astronomy that interests you, and submit it to our Nova Notes Editor. You just might be next year's Burke-Gaffney Award winner! Below is more information about the award.

The Burke-Gaffney Award

The Burke-Gaffney Award was established by the Halifax Centre to promote the development of the writing skills of non-professional members of the centre. The award also acknowledges the contribution of the centre's first Honorary President to the formation of the group and to his long and tireless efforts to educate the public in the mysteries of astronomy.

Rules

1. Topic: Awards will be given for articles relating to astronomy, astrophysics or space science. Topics should interest average to well-informed amateurs and may be of current or historical nature.

2. Presentation: Articles should be no longer than 1000 words, written in proper grammatical form and presented typewritten and double-spaced (preferable in electronic format). Diagrams should be complete and

ready for drafting and photographs should, when possible, be submitted with the original negatives.

3. Eligibility: Any member of the Halifax Centre in good standing is eligible with the exception of those who are professional astronomers.

4. Judging: Articles will be judged on scientific accuracy, originality and with a strong emphasis on overall literary merit. Papers must demonstrate that the author(s) has/have read widely and has/have contributed some original thought to the discussion. Judging will be carried out by a committee consisting of the President, Nova Notes Editor and a third person appointed by the Halifax Centre's executive.

5. Prize: The award will be given once annually. The winner of the Burke-Gaffney Award will receive as the prize one book, of the author(s) choice.

6. Submission of Entries: All qualifying articles received and published in the preceding year's Volume Number of Nova Notes will be considered and judged for the award. Inquiries concerning the rules may be directed to the President.

7. Previous Awards: The Burke-Gaffney Award has been won on thirteen previous occasions:

1979	Bill Calnen
1980	Bill Calnen
1981	Diane Brooks
1982	Michael Boschat
1983	Jennifer Wells
1984 to 1987	<i>no award given</i>
1988	Dan Falk
1989	<i>no award given</i>
1990	<i>no award given</i>
1991	David Fleming
1992 to 1995	<i>no record of awards having been given</i>
1996	Diane Brooks
1997	Roy Bishop
1998	Michael Boschat
1999	Graham Millar
2000	<i>no award given</i>
2001	Blair MacDonald
2002	David Chapman

February Meeting Report

Johnny McPherson

The Opening

Well, if you decided to stay home and watch the Canadian Men's Olympic Hockey Team lose to the Swede's, not to fear. Here is the report on the February 15th meeting of the Royal Astronomical Society of Canada – Halifax Centre as I saw it.

The Halifax Centre President, Mary-Lou Whitehorne, called the meeting to order at 20:02. In opening, she recounted the many wonderful benefits of RASC membership. I know that people in attendance at any meeting are familiar with hearing about the rewards of membership, but they really are quite impressive. They include telescopes for lending, books for borrowing, an observatory for well equipped viewing sessions, Observer's Handbook, Sky News subscription ... you get the idea. A couple announcements of note were made: The Centre is looking for a new Webmaster. If you have a few hours a year to spare, and the skills, please consider this worthwhile undertaking. The Centre has received an official invitation for this year's General Assembly. It will be held at McGill University in May. You may register at the RASC web site, www.rasc.ca:22002/rasc/index.jsp, or pick up an application at a future meeting.

The Main Talk

The floor was turned over to the keynote speaker of the evening, Craig Levine. Craig is a new member of the Halifax RASC and sits on the executive as Secretary. He is an amateur astronomer and was struck by the telescopic view of M13, an impressive globular cluster. A moderate sized telescope will provide views of these stellar structures resembling diamond dust scattered on black velvet with delicate patterns and strings of stars. Globular clusters, although interesting visually,

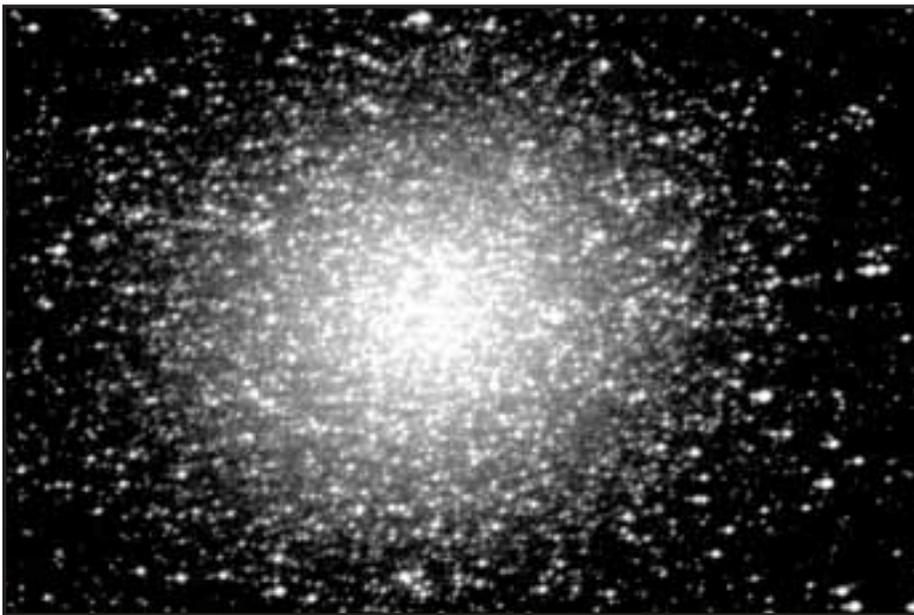


Photo of Omega Centauri taken at the Winter Star Party 2000 by Dave Lane and Greg Palman.

also contain many peculiar objects such as white dwarfs, cataclysmic variables and millisecond pulsars. In his talk, Craig brought to the audience's attention the intriguing contents and physics of globular clusters; hence, the title of the talk, Globular Clusters: More Than What Meets the Eyepiece.

First, a definition of globular clusters was provided. Visually they have a roughly circular shape and appear to be entirely made of stars, lacking diffuse gas or dust. Globular clusters also contain 10^4 to 10^6 gravitationally bound stars, are a few dozen to 300 light years in diameter, have up to 10^4 stars densely packed in their cores and orbital periods greater than 10^8 years. Some open clusters may visually resemble a globular cluster, so what makes them different? A variety of indicators were presented: A sky map from the "Cambridge Star Atlas" was displayed to show that open clusters are distributed throughout the plane of the Milky Way. Globular clusters form a halo around the centre of our galaxy. Another difference is that the upper limit of the total stellar mass in open clusters just meets the lower limit for globular clusters. Another is the "metallicity" of the two. Metal, in astronomical terms, means any element heavier than hydrogen and helium.

Globular clusters have a lower metallicity than open clusters. This low metallicity is important because it is evidence that globular clusters are among the oldest objects in the universe. Before star formation, the universe was mainly hydrogen and helium. These gases coalesced into stars. Many of the early high-mass stars in the universe sped through their lives and spewed out the elements that make up the metals. In contrast, the stars in globular clusters appear to be first-generation stars that hold onto the pristine characteristics of the early universe. Also, the H-R diagrams of globular clusters show a distinct turnoff to the red-giant branch – an indicator of old age. Generally, open clusters are relatively young and do not exhibit a prominent branch.

Astronomers in recent years have also made discoveries about the contents of peculiar objects within globular clusters: "Blue Stragglers" are stars thought to be the product of merging stars. However, there are currently ten models dealing with their creation, so the problem is still open for interpretation. To date, there are four known planetary nebulae. This fact led to a question at the end of the talk, which I will get to later. White dwarf stars are numerous in some globular clusters,

such as M4. The presence of cataclysmic variables provides evidence for a theory that close binaries are formed that support the core against collapse from its own gravity. RR-Lyrae stars are standard candles that enable astronomers to calculate distance to globular clusters. Finally, millisecond pulsars are also found in globular clusters.

The audience was now piqued by these beautiful and interesting objects. Nicely primed for a night at the eyepiece observing globular clusters, Craig then presented a list of interesting globular clusters to the audience for observing. There are 90+ visible in the Northern Hemisphere and 28 of them are on the Messier List. Here is Craig's list of interesting globulars:

NGC104, a.k.a 47 Tucanae. This cluster is 30 arc-minutes across, the same as a full moon.

M22. The first globular cluster discovered.

M54. This globular is not part of our galactic system.

NGC2419. It is moving faster than the escape velocity of the Milky Way; therefore called the "Intergalactic Wanderer." It was also noted that globular clusters not associated with a particular galaxy have been observed within clusters of galaxies.

Omega Centauri. This is the biggest globular cluster in the Milky Way.

Globular cluster G1 in M31. This has the brightest absolute magnitude of any globular cluster in our local group of galaxies.

Questions

One person asked, "why do globulars have no metals?" Answer: The stars are first-generation stars.

Another question was, "do planets exist in these clusters, and if they do what would the sky look like?" Planets are not known to exist. The tidal forces within globular clusters are too great to allow planet formation. If they did exist, the sky would be as

bright as compared to a full-moon lit night on Earth.

Also, “where is the gas that is known to be expelled from the older stars – planetary nebulae have been observed?” All the gas is stripped from the clusters when they orbit through the Milky Way’s disk.

That was it for the talk. The HST images and informative slides further enhanced the presentation. You may obtain a CD of the presentation from Craig, one of which I myself obtained during the break. Just a quick thought on the break – I am happy to see that the Centre’s members have great taste and prefer “President’s Choice” cookies over any other.

The meeting reconvened after a short while and those in attendance were treated to a now regular “Handbook Talk.” The purpose of this series of talks is to familiarize the Centre’s members with the “Observer’s Handbook” and provide interaction. Pat d’Entremont makes his living as an IT specialist, so he chose to talk about Web Resources, pages 14 and 15 of the 2002 Observer’s Handbook. Pat explored the URLs listed in the handbook and summarized his likes, and dislikes for some.

The American Association of Variable Star Observers at www.aavso.org provides amateur astronomers with a wealth of information about variable stars, and a way for them to participate in valuable research.

Astronomy magazine at www.astronomy.com has a great photo gallery and a planetarium software simulation of the night sky.

The Sky & Telescope web site at www.skypub.com wasn’t as flashy as some sites, but Dave Lane informed us that the site has been totally redone within the past couple of weeks and is now a flashy site worth revisiting.

The SkyNews web site www.skynewsmagazine.com Pat

found a little disappointing. It was mainly a sales pitch for the subscription, but had a nice photo gallery. The Hubble Heritage Site at www.heritage.stsci.edu is a must see. It is loaded with images taken with the Hubble Space Telescope. Some are presented as MPEGs showing change in an object’s appearance over time.

Loads of information about the Leonids can be found at leonid.arc.nasa.gov.

When visiting www.heavens-above.com, be sure to enter the hyphen. This site is mainly a satellite locator tool, but also has a lot of general astronomy information.

The Canadian Space Agency’s site at www.space.gc.ca is a must visit for educators and parents. A lot of resources for teaching children about space.

The International Dark-Sky Association web site at www.darksky.org is text orientated and multimedia repressed.

The NASA Jet Propulsion Laboratory site at www.jpl.nasa.gov is great for beginners and kids.

The Royal Astronomical Society of Canada has their web site at www.rasc.ca. Pat found it a good resource for finding publications for sale.

Not in the handbook, but a couple of Pat’s favourite sites:

<http://liftoff.msfc.nasa.gov/RealTime/JPass/20/>.

This is also a satellite tracker. It has a sky map that shows the location of the satellite of your interest, and in relation to the other satellites in the sky at the same time. There is also a 3-D option.

NASA’s humanspaceflight. I missed the URL, but if you enter this in a search engine as one word, several interesting hits are returned. The one of Pat’s interest was also a satellite tracker that plotted trajectory changes that are necessary to keep the ISS aloft. Pat finished off his presentation

with the Halifax Centre’s web site at www.halifax.rasc.ca. Before Pat actually came to the Centre, he perused the old Nova Notes online and felt that he already knew the people involved and saw the human side to astronomy. Now with this article, someone else is learning a bit about Pat. Paul Heath was fingered to give the next Handbook Talk.

What’s Up

Dave Lane gave a summary of What’s Up for observing. Here is a point form summary. Venus is a difficult object to observe this month (for some). Next month it will be more noticeable, but not prominent. Jupiter and Saturn are the two planets presently dominating the sky. As I sit here writing this, the Moon is about midway through an occultation of Saturn. Clouds are occulting the sky. It is now 21:30 on February 20, 2002. There will be a double shadow transit over Jupiter on March 14, 1:13 A.M. Hopefully there will not be a cloud shadow over the Earth. A fireball over Ontario on Valentine’s Night was estimated to be negative 16 magnitude! A new comet has been discovered – Ikeya-Zhang. It is currently near the horizon in Pisces, but predicted to reach +6 mag. in March. See Sky & Telescope (or visit their web site) for details.

Happy Observing!
Johnny McPherson ★

Speaker Exchange with Moncton Centre: Report

Dave Chapman

On Saturday, March 16, 2002, I travelled to Moncton to present my talk “A Date with the Stars: The Astronomical Basis of Our Calendar”. The idea came up when I bemoaned the fact that I had put all that work into the talk, only to give it once, at the RASC Halifax Centre

at this January's meeting. Our esteemed President Mary Lou Whitehorne snapped into action and arranged a speaker exchange with RASC Moncton Centre, and I soon received an invitation from them to speak at their March meeting.

The "Moncton" Centre has significant membership in Saint John and area, and they actually alternate meetings between Moncton and Saint John. Also, they are meeting only every two months. I reckon they have 6 meetings a year, three in each city. On Saturday, they had a special "constitution" meeting in the morning, followed by a lunch break, then the main meeting in the afternoon. My talk was slated for 3:00 P.M.

I arranged to come up Saturday morning and to join them at about 2:30, which was a good plan, as there was a very heavy freezing rain on the Friday night, and the roads were still a little slippery in the morning. I took my family for the outing: we took 3 hours to drive, grabbed a bite of lunch, checked into our hotel for an overnight stay, then I was dropped off at the University to give the talk. I was received warmly, although the crowd of 15 was a little thin on account of the weather. Nevertheless, there was a lot of interest, and there were a lot of questions after. I even got to give my "days of the week" mini-talk at the end! Those Monctonians have stamina!

After the talk, the Moncton Centre continued with their interrupted business meeting. Then about a dozen of us went to Mexicali Rosa's for dinner (my daughter's choice) where we got to visit a little. This was an enjoyable visit and we should make it an annual tradition to send someone up to give a talk. They will be returning the favour, probably in the fall. ★

Shake the Shakes

Some comments on the Canon 10X30 Image Stabilized Binoculars

Daryl Dewolfe

What Fun!!

I have owned several pairs of binoculars over the years, primarily for astronomical use. Some were heavy, some were optically good (Pentax 8X40s), some excellent (Celestron Ultima 10X50s). My personal rating system goes from fair – good – very good – excellent – superb – Oh My God! I've only come across one pair with the later rating. It was a pair of Zeiss 15X60 binoculars owned by the Honorary President of the Halifax Centre, which I will never forget observing through. As in most astronomical optics, one gets what one pays for. Bargains are rare. However, if you ever get the opportunity to check out the Canon Image Stabilized binoculars then beware, you may be tempted to part with some significant coin to own them. They are a lot of fun!

I won't go into a lot of the technical jargon on how they're constructed. You can pick that up in the other reviews mentioned below, or from the Canon web-site. I'll focus on what one can see with them, as well as nitpick any flaws I can detect.

Optically, my rating is Superb; probably closest to the aforementioned Zeiss than anything I've seen to date. I guess the field flattening doublet system Canon uses really works. Bright objects are nearly colour free; at least equivalent to a semi-apochromat refractor. From an suburban location on a clear night, 4 moons of Jupiter were visible, along with the brighter galaxies M81 & M82 in Ursa Major. Galaxies to 9th magnitude were visible from the St. Croix Observatory site. With a 6 degree field of view, Comet Ikeya-Zhang and large objects like the Pleiades were great! The sheer convenience of shake free astronomical observing was wonderful. Arising very early one morning after a sleepless night, I

remember picking up the binos and observing globulars M80 & M4 in Scorpius, and then splitting Alberio in Cygnus, from inside my home, through the windows of my sunroom.

Design wise they feel very comfortable to hand hold, but they do not feel the same as holding traditional binoculars. They are more boxy looking. Nice, rubberized, easily gripped body, & very lightweight (21 oz./600g). The focus knob operates very smoothly over its range, The diopter adjustment ring moves firm and smooth. Interpupillary adjustment easily accommodates varying eye widths in users. The eye relief at 14.5mm, is excellent, even for eyeglass wearers.

Flaws ??

- Battery consumption. They run on AA alkalines, rechargables, or lithiums. I would say that regular dept. store alkalines should last about a month with normal / frequent use. I recommend the lithiums.
- Optic lens covers / dust jacket. Due to the design of the binos, there are no objective lens covers. There are eyelens caps. The binos come in a dust free fabric sleeve which is quite useful for keeping the lint off the lens.
- Hard shell case. The binos come with a soft-sided case. A hard shell one is not available.
- Price – are they worth it? The price has changed a lot over the past year. Deep discounts are available if you know where to look for them. The 10X30s cost significantly less than the other IS models.

That sums it up in a nutshell. You can get more feedback and information by reading a review of them in the December 1998 RASC Journal, Volume 92 #6 pg. 327, by Chris Baldock, or reviews of the larger models by Dennis di Cicco in Sky & Telescope magazine May 1998, or by Gary Seronik in Sky & Telescope July 2000. Also visit the Canon website on the Internet. ★

The St. Croix Observatory



The St. Croix observatory. Pictured from left to right, the RASCan, the warm room and the roll-off roof observatory.



The roll-off with the roof partially open.

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:*

Sat. May 11th

Fri. June 7th (rain date Sat. 8th)

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.

Adventures at the SCO.

It was a great night at SCO. Comet Ikeya-Zhang was clear and visible naked-eye. In 7X50 binoculars the tail stretched half of the field of view. In the 10" telescope it showed a bright coma. The tail swept straight back widening to about 3X the width of the coma. The first third of the tail was distinctly brighter than the remainder of the tail.

Tonight was an exceptional night for planets. Jupiter showed a lot of detail in the main equatorial belts. The southern equatorial belt showed a well defined dark spot within the band. A south sub equatorial belt was also clearly visible as well as polar shading. A star of equal brightness made a fifth "Galilean moon" beside Ganymede.

Saturn was the best that I have seen. The rings were stark and very well defined. I saw the Cassini division for the first time. The shadow of the rings showed clearly as well as polar shading. Titan was bright and three faint points of light hung just outside the rings.

I was also able to gather two more Messier objects. Only 20 to go!!

If you haven't seen it yet get out to see Comet Ikeya-Zhang, it looks great.

– Paul Heath

Meeting Announcements

Halifax Centre of the Royal Astronomical Society of Canada



April 19

“The Astronomer’s Apprentice”

by Daryl Dewolfe

Brief Description: Caroline Herschel’s enduring contribution to astronomy. From servant girl to Gold Medalist in Science, was she the “brains behind the brawn” in the Herschel family of astronomers?

Note earlier date for May May 10th

“Observa-Stories”

Craig Levine, Pat d’Entremont, and Rollie Strand will entertain and inform members with their impressions of astronomy from the perspective of a newcomer to the hobby. Bring your questions and your sense of humour!

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

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

