Nova Notes

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

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In this issue:

Front Page Photo: Blair MacDonald
Jupiter (Details page 9)

From the editor *Quinn Smith*

Where does the time go? It seems like only last week we were preparing for Nova East and now it's dark at 5 p.m. At least it was last week when I was in Las Vegas attending a trade show. What has this to do with astronomy you ask? Well, because of regular trips to Las Vegas since the late 80's I have had the misfortune to see first hand what happens to a wonderful observing site (Red Rock Canyon) when a city grows from 500,000 to over 2,000,000. The population growth, coupled with the excesses of Las Vegas lighting (don't get me started about the Luxor casino), has essentially destroyed the night sky for tens (if not hundreds) of kilometres in all directions. However, I did discover a rather interesting astronomical find, not in Vegas, but just outside. Since this edition of Nova Notes did not have room for an article on this discovery, it will have to wait for the next edition.

Talking of Nova Notes, we have a returning article—"Quick Tips". Thanks to "The Frugal Astronomer" we have another suggestion, but I was hoping for more suggestions from other members—so please send in your tips. Also in this edition I have included a new article, namely "Featured Astronomer of the Month". Thanks to Jeff Donaldson for submitting not only some excellent photos, but the story behind them. I hope that this feature will become a regular in Nova Notes, so please consider submitting your pictures and the story behind them.

Lastly, the December meeting is the Annual General Meeting and the opportunity to vote for, and support your new Executive. I look forward to seeing lots of my friends at the meeting—after all it is the end of the world a week after the meeting!

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, use of the Centre's 437mm dobsonian telescope and 100mm binoculars, a warm-room, and washroom facilities.

Enjoy dark pristine skies far away from city lights, and the company of like minded observers searching out those faint "fuzzies" in the night. Observing nights (Fridays close to the New Moon) are open to both members and guests. If you are not a key holder and would like to become one, or need more information please contact the Observing Chairman, John Liddard (for contact info, see below).

Upcoming Observing Nights:

December	14th	2012 (subject to change)
January	11th	2013
February	8th	2013

Meetings begin at 8 p.m. at Saint Mary's University

Our usual room is AT 101 although check the web site (www.halifax.rasc.ca) for room changes.

December 14th 2012

Our Annual General Meeting plus: "Who Wants to be a Gazer?" A not-to-be-missed journey into astronomical insanity

January 18th 2013

Guest speaker: Michael Palmer will talk about "Star Formation in Merging Systems".

February 15th 2013

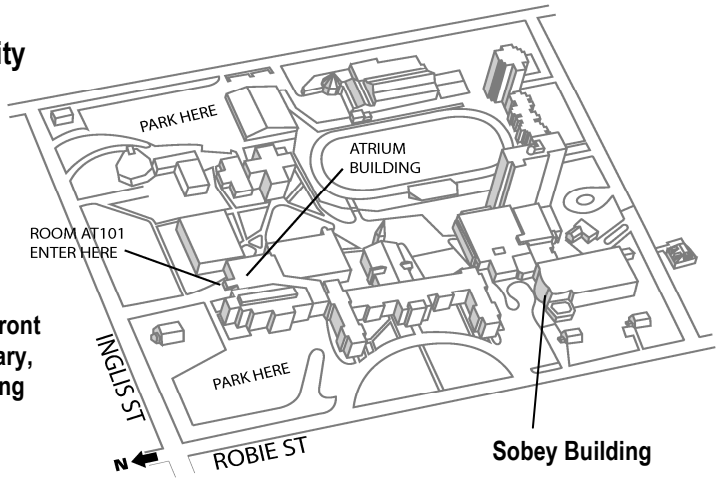
Guest speaker: Mary Lou Whithorne will talk about the recent solar eclipse in Australia.

All meeting location and contents subject to change

Meeting Location:

Saint Mary's University

Atrium Building
Room AT 101



The Atrium is located in front of the Patrick Power Library, between the Burke Building and Science Building.

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

The NOVA program (an introductory course in astronomy) will not be held this year.

Executive meetings begin at 7:00 p.m., in room AT 306, and all members are welcome.

Halifax RASC Executive, 2012:

Honorary President	Dr. Roy Bishop	902 542 3992	RLB@eastlink.ca
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Nova East Report

Blair MacDonald

General:
This year's event featured two guest speakers, namely David Levy and Kathryn Gray. David's talk was about his life as a comet hunter and astronomy enthusiast. Starting with his early efforts and ending with the media circus surrounding the discovery of Shoemaker-Levy 9, David took those in attendance along on his personal journey of discovery.

Katheryn Gray's talk described her experiences since she became the youngest person to have discovered a supernova. Her talk, aptly titled "The Circus" described the media attention and events that followed the discovery from being invited to open the Starmus Conference, to making Glamour Magazine's list of 21 amazing young women of 2011.

Observing:
Friday evening was a spectacular night with many of those in attendance observing well into the wee hours of Saturday morning. Saturday evening brought higher humidity and some cloud, but there was still some observing to be had and scopes were busy showing members of the public various objects until midnight.

Auction:
Saturday featured a very successful equipment auction with members contributing several items ranging from books and eyepieces to telescopes and a CCD camera. Most of those entering items in the event waived their 50% portion of the proceeds, and effectively donated them to the Centre, helping to make the event a huge fiscal success.

Milky Way over Nova East 2012—photo by Blair McDonald

	Number	Price	Revenue	Costs	Profit
Registration	**61**	**$40.00**	**$2,440.00**	**$2,690.66**	**-$250.66**
T-Shirts Sold	**41**	**$25.00**	**$1,025.00**	**$392.15**	**$632.85**
Camping Nights	**56**	**$25.00**	**$1,400.00**	**$1,048.57**	**$351.43**
Unaccounted for	**1**	**$25.00**	**$25.00**	**$0.00**	**$25.00**
Auction 50/50			**$1,593.00**	**$105.00**	**$1,488.00**
Donation					**$50.00**
Sale of solar filter material					**$83.00**
Total			**$6,483.00**	**$4,236.38**	**$2,379.62**

Financial Details:
Financially this year's event was very successful, continuing the positive balance sheet of previous Nova East events. The final balance sheet is detailed to the left.

Nova East Chairperson
Blair MacDonald

Hal-Con 2012

Tony Schellinck

On Friday October 26th Tony Schellinck presented a workshop titled "The Secrets of the Universe as Revealed by Star Wars" to a room full of Star Wars fans attending Hal-Con 2012.

The accompanying workshop description said "Tony Schellinck, an amateur astronomer, will prove that much of what we have learned about astronomy and the universe was revealed to us in the Star Wars saga. Those who laugh at the science in Star Wars will forever be silenced as the truth is revealed. Please note, many Bothans died to bring us this information."

The premise of the talk was that despite some evidence to the contrary, George Lucas was actually inspired to create the Star Wars saga because in 1971 he returned from a visit to the future where he learned the truth about what is out there. He subsequently decided to inform the world of these facts by making a science "fiction" movie.

The opening scene of the Tatooine's twin suns (Tatoo I and Tatoo II) setting brought up the points of what a binary star system is, how many binary star systems there are, particularly those involving sun-like stars, and the recent discovery of five circum-binary planets. All of which proved that George Lucas got it right to picture a binary star system.

Tony then discussed "The Force" which has a dark side. This led to a discussion of the existence of Dark Matter and how it was discovered. He then talked about the more recent discovery of Dark Energy, long after it was predicted by Lucas.

This lead to a discussion of the expansion of the universe since the big bang and the discovery that the Dark Energy (Force) must be evil since as of three or four billion years ago it started to tear the universe apart. This is why Lucas set the Star Wars saga a long time ago in a galaxy far far away. George Lucas could only have known this by visiting the future.

In episode 1 of Star Wars, Anakin Skywalker is told that the force emanates from what must be an elementary particle, called a midi-clorion. Tony then (very briefly) discussed what elementary particles are and the discovery of the Higgs boson, the 61st elementary particle, whose interaction with the other particles may determine their mass. It has been reported in the media that the LHC is still at half power and will look for further particles that will possibly explain Dark Matter and even Dark Energy. The latter particle will of course be called the Lucas boson, after its discoverer, George Lucas.

Tony giving his talk at Hal-Con 2012

Nerd Credentials

Tony is a sci fi and fantasy nerd as evidenced by Petra the Dragon which he crafted from cement and rebar and placed on his front yard.

The sixth episode of Star Wars takes place on the "Forest Moon of Endor". Before Lucas, few cinematographers had thought to place a civilization on a moon; the location was almost always a planet. Why did Lucas do this? He did it because he knew that man had a good chance of finding life on moons (an idea way ahead of its time). We then discussed the possibilities of finding life on the Galilean moons Ganymede, Europa and Callisto. Since the making of Star Wars the presence of hidden oceans below the surface along with a very thin atmosphere of oxygen for Ganymede and Europa have been discovered. As the Sun grows hotter, could these moons become teaming with life? Titan was also discussed as a possible location for life in our solar system outside of the Earth.

Some aspects of Star Wars not yet proven to be true were also discussed, including the ability to hear sound in space (not really tested yet), the ability to travel through hyperspace or go faster than the speed of light, and finally, the need to bank a space ship as you would an airplane if there is a change of course in space. There ensued a spirited fifteen minute Q&A period during which many questions were asked about space and astronomy as the audience were already quite familiar with Star Wars.

October Meeting Report

Chris Young

The Centre President, Robert Bussiere, opened the meeting welcoming the 34 people in attendance, including 1 visitor, in his usual humorous style – apparently Apocalypse Insurance has gone up in price as we approach December, and sales are good! Astrophotos from Centre members provided a backdrop on the main screen as Robert introduced the evening's speaker Dr Roy Bishop. Robert was pleased to announce that on November 15th, Dr Bishop would be honoured at the Annual Discovery Awards dinner for Science and Technology with his induction into the hall of fame of the Discovery Centre for his work to promote science and in particular astronomy. Congratulations Roy!

Robert then introduced the topic of this month's talk, by way of a story about a compass he bought as a teen which always pointed south!

Dr Roy Bishop then gave a presentation titled: "Navigation – Lost on the Oceans". With a painting of an 18th century square rigger on the screen, Roy asked … "with no land in sight how do you find your way home and avoid the hazards of rock and ice?" The magnetic compass was used by the Chinese in the 11th century to determine a heading but to define your position on the earth two coordinates are required. Latitude sets your N-S position and the position of a star can be used to determine this.

Longitude, setting your E-W position, has no natural reference plane and the difference between local time to that on a reference meridian is required – this needs an clock accurate to 2 seconds a day. A rolling ship introduced errors into pendulum clocks and an accurate clock was not available until the 18th century.

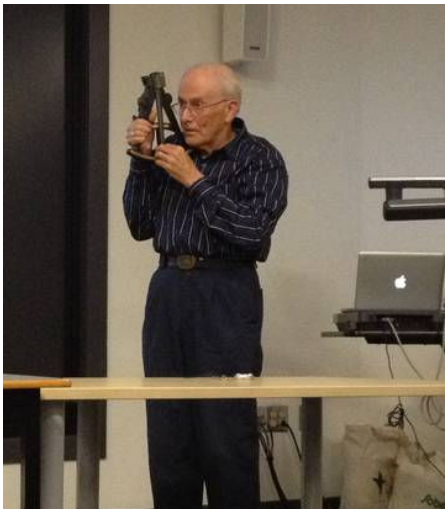
There are several methods of determining local time on land – you could determine local noon using shadow dial (i.e. equal altitude method) however you can't do this on a rolling ship, and the elliptical orbit of the Earth introduces errors. One could use the positions of the satellites of Jupiter compared to their reference locations - however the difficulties on ship of using a high power telescope, having a clear sky, and Jupiter at a high elevation make this method impractical. A time exposure of Jupiter from a ship's deck shows an image of a dancing line instead of a point which was what was needed. After 1760 there were reasonably accurate predictions of the position of the Moon relative to the Sun or other stars, and these were published in the Nautical Almanac. A lunar eclipse might also be used if it occurred and was visible. It was these references, along with the invention of the octant and sextant, that permitted reliable positioning.

Various instruments to measure altitude were invented over time with improved accuracy: the cross staff in 1330, accuracy of 60'(1degree), the mariner's astrolabe in 1480, accuracy 1 degree, backstaff 1595 accuracy 50', octant 1731accuracy 1', sextant 1758 with a telescope & vernier accurate to 0.25'. (Roy demonstrated the use of the sextant however I will refer the reader to Wikipedia's thorough description for the sake of brevity!)

Carrying an accurate clock at sea to determine longitude had been proposed as early as 1530. It took John Harrison to invent a reliable marine chronometer in 1759. This was his H4 clock, approximately 6" in diameter, which resisted the inaccuracies the movement of a ship introduced into other time pieces. By 1800 all sizable ships carried at least 1 and sometimes 3 of this type of time keeping device.

Roy expressed his admiration of the British navigator Captain James Cook who mapped the location of South Georgia Island with a sextant in 1772 and was remarkably close in determining its exact location using a clock modelled after Harrison's.

The sextant remained the principal tool of navigation until after World War 2 when radar, LORAN and now GPS has made its skilled use unnecessary.



Dr Roy Bishop demonstrating the use of a sextant during his talk.

LORAN (LOng RAnge Navigation) is a terrestrial radio navigation system which enables ships to determine their position and speed from low frequency radio signals transmitted by land based beacons.

The Global Positioning System (GPS) is a satellite navigation system that provides location and time information anywhere on the Earth. It was developed by the US military and became fully operational in 1994. It is now accessible to all with a GPS receiver. The system relies on knowing the difference in signal times from four or more GPS satellites within nanoseconds. The system has to accommodate gravitational time dilation which is the effect of time passing faster for the satellites which are farther from the source of gravitation. A practical application of the theory of Relativity!

Dr Bishop, who uses a GPS, concluded by expressing some regret on the passing of the use of the sextant and the necessary knowledge of the stars it required.

Robert thanked Roy for his excellent presentation noted that the good old days were not always so simple!

Polarie in the Crosshairs

John McPhee

Whenever I'm reading equipment reviews, I usually want the writer to quickly get to the point: Is this thing worth the money?

The thing in this case is Vixen's Polarie star tracker. And the price I paid was $505 including tax with free shipping from the Canadian Telescopes online store. I dipped even farther into my wallet, a distance of $340, for the optional polar scope. The scope, so I'm told, allows for pinpoint polar alignment and much improved tracking and imaging of celestial objects. So we're talking $745 for something that allows you to take long, accurately tracked exposures. Obviously I would have liked to have paid less, but Vixen has the market cornered in portable photographic tracking with the Polarie.

It was important to me to get better astrophotos without getting into the $1,000-plus range, and the Polarie has allowed me to do that. So call it a reluctant yes, it's worth the money.

Here's how it works: You hook the Polarie up to your camera with a ball-head mount, and its small motor drive moves your camera in sync with the motion of the sky. As a result, star trails are eliminated and you get brighter, more detailed images of objects such as nebulae and star clusters.

IN THE FIELD

I've had the Polarie out about five times since buying it in the late spring. (I live in the city so my main opportunities for dark sky imaging are trips to the St. Croix Observatory and Kejimkujik National Park).

I've been generally pleased with the results. The Polarie's "first light" was, not surprisingly, a wide angle 70-second exposure of the nebulae-rich Sagittarius and Scorpius region. The Messier objects in this area, particularly the bright Lagoon, really popped.

Photo: John McPhee Close up view of the Vixen Polarie camera tracker mounted on a ball end tripod, with a camera mounted on the output shaft.

I've also spent a lot of time on the Summer Triangle and Taurus/Pleiades regions, with varying results. The faint North American nebula in Cygnus was easily visible in one of my shots. I expected better results from my Pleiades shots - the nebula surrounding the cluster is visible but doesn't pop out as I expected.

But likely that's a matter of expecting the Polarie to fully compensate for my failings in the crucial stage of processing and stacking the photos. I'm betting my results will be better when (optimistically speaking) I've improved my technical skills.

Upon the advice of our resident astrophotographer extraordinaire, Blair MacDonald, I keep the exposures to about a minute and shoot a lot of them in raw mode. I make sure to take a dark frame that's later subtracted from the stacked light frames to cut down on the digital noise.

IN THE CROSSHAIRS

When it comes to its main purpose, eliminating star trails, the Polarie more than passes the test, even in longer exposures.

But the process of getting the Polarie properly aligned to achieve those happy results can be a challenge. The small "sight hole" on the right side of the unit isn't exactly user friendly. Even under the dark skies of St. Croix, it's a bit of work to find and centre the North Star, Polaris.

The polar scope, which is inserted into the body of the Polarie unit, is obviously a big improvement on the small viewfinder, providing crosshairs and brighter star images. But it's not illuminated, meaning you have to indirectly shine a red light into the objective lens end of the scope in order to precisely centre Polaris.

I've found it difficult to get Polaris lined up precisely in the cross-hair configuration. You must get the star between two tiny hash-marks on one

part of the cross-hairs, and that's not easy using my admittedly low-end ballhead mount and tripod set-up. I've yet to get Polaris exactly where it should be.

And just a note for those of you who share my technical (some might say common sense) challenges. Once you're centred the unit on Polaris, keep it there. I initially had the daft notion that if I kept the unit at the same inclination as Polaris, I could move it around. (My companions at St. Croix politely set me straight). Obviously you can move your camera on its separate ball-head as you change astronomical targets.

CHANGING GEARS

The Polarie offers several different drive speeds, depending on what you're shooting. I've stuck mainly with the wide-field astrophotography mode. Other speeds will allow you to image the Sun (with your camera lens properly filtered) and the Moon. Another mode, called star-scape, keeps the foreground motionless for more pleasing landscape and night sky compositions.

Besides the Polarie's main purpose of keeping celestial objects centred, the big draw for me is its portability. If something is easy to chuck into a camera bag, you'll use it more often, plain and simple.

The Polarie is about the size and shape of a large point-and-shoot camera. (It even comes with a hot shoe, although it's not clear what accessories would be feasible with it.) And the Polarie weighs only 740 grams before you add the two AA batteries.

And you must bring a lot of those AAs for a longer session, particularly if it's cold. The Polarie eats them up pretty quickly. (The unit does come with a mini-USB port for a 3V adapter.) I'm looking forward to exploring the potential of the Polarie and hopefully producing those astrophotos that for now exist only in my imagination.

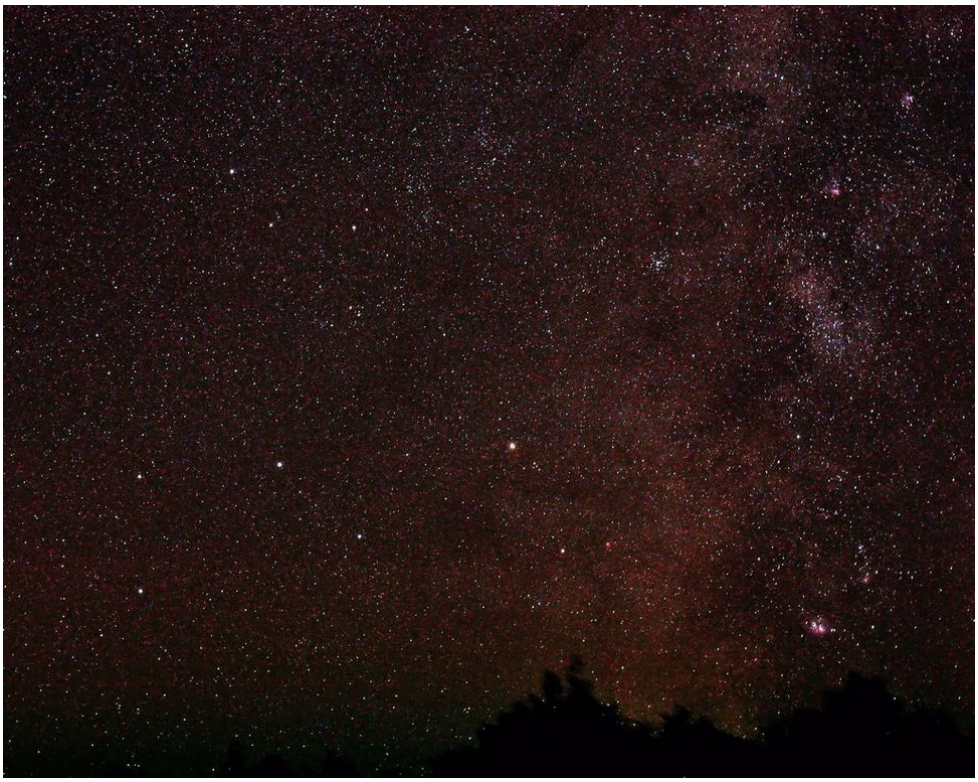


Photo: John McPhee. The Sagittarius-Scorpius region taken in August 2012 at St. Croix Observatory, using the Polarie camera tracker.

Photo: John McPhee The bright object near the centre of the frame is Jupiter near the Hyades cluster taken from Kejimkujik Narional Park in October 2012 using the Polarie camera tracker.

November Meeting Report

Robert Bussieres

Upon arrival at the meeting room, members were entertained with an astrophoto presentation on the meeting room main display. These astrophotos had been taken by our membership during the course of the previous month.

Our president, Robert, introduced the "2nd last meeting before the end of the world." to an audience of 34 including 2 visitors.

Robert then introduced the Executive members who were present and also listed the upcoming Executive Member for year 2013. He stated that we were still looking for a 1VP and possibly another Councilor.

For the benefit of our visitors he described the benefit of been part of our Society. Where the only requirement for joining is to have a brain, having good eyesight is only optional. To prove his point, he stated that some of our members can actually count meteors by just listening to the radio. Robert reminded the audience, that now was the last opportunity for the membership to contribute items for the Transit Of Venus time capsule. He intended to seal it on the weekend. Robert then introduced the main speaker for the evening.

Dr Phillip Bennett is an Adjunct Professor in the Astronomy and Physics Department at Saint Mary's University. Formerly, he was a Research Associate at the Center for Astrophysics and Space Astronomy at the University of Colorado in Boulder, Cororado. He is also a Scientist VII at Eureka Scientific. Eureka Scientific is a California corporation founded in 1992 by eight research scientists of the University of California, Berkeley. It was created to promote the pursuit of scientific research in astrophysics and other related fields. Dr Phillip Bennett's research specialty is outer atmospheres of cool stars.

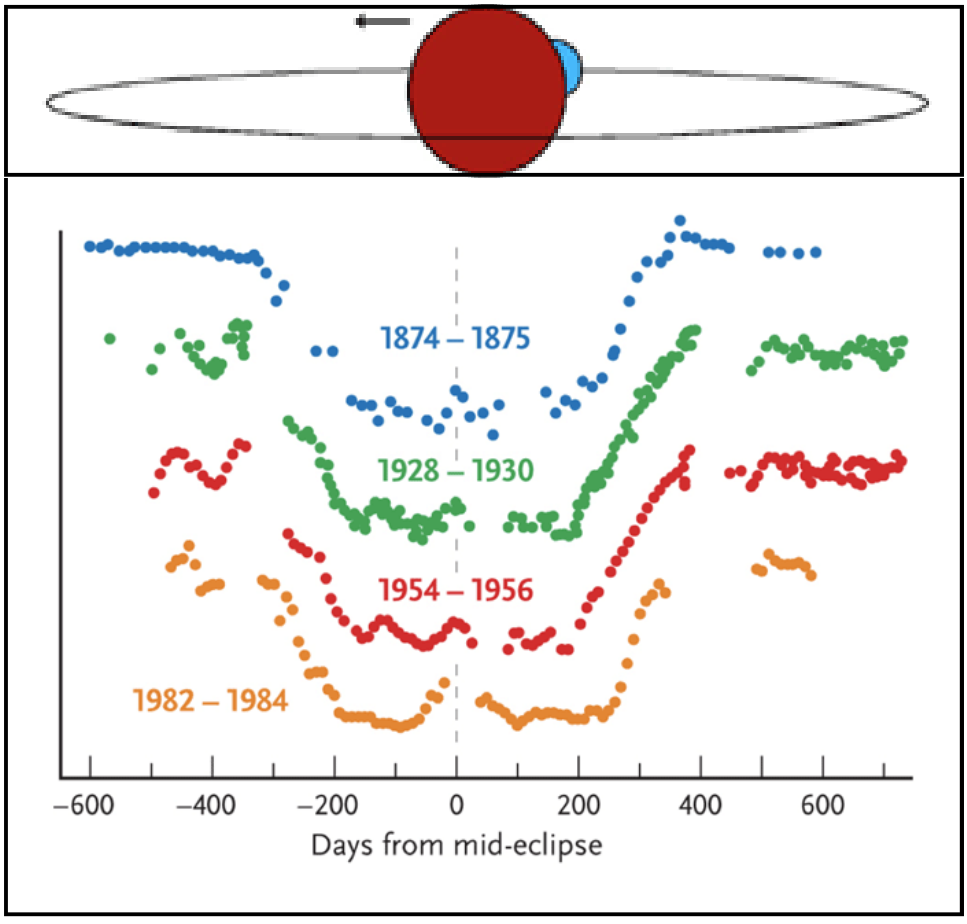
He stated that the talk for the evening will be: "What do we really know about the long-period eclipsing binary epsilon Aurigae? - observational constraints and implications for the evolutionary state of the F star".

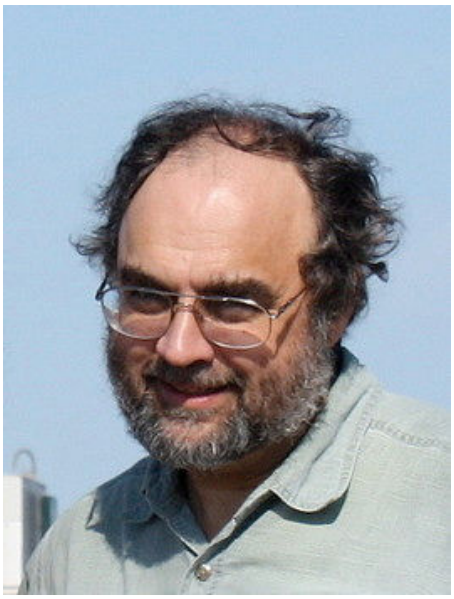
Epsilon Aurigae is a famous, well-observed, long-period eclipsing binary star. It is noteworthy for being one of the oldest known variable stars, and for having the longest period of any known eclipsing binary (27.1 years). Dr Bennett also recommended that people go to his webpage and look at his video "Hotel Mauna Kea". There they will see that observing is hard work but there are also a lot of good times.

Epsilon Aurigae is a bright (3rd magnitude) long-period binary that has been continuously observed for more than 160 years. The observed spectrum is that of an apparently normal F supergiant. The system is enigmatic because the eclipsing companion is dark: no light is seen from this object in the optical spectrum. Nevertheless, the companion is large enough in physical extent to eclipse half of the (large) stellar disk of the supergiant star for more than a year and half.

It is also massive: accurate spectroscopic orbital solutions have recently been obtained by two groups, showing the F star primary has a (large) radial velocity amplitude 14.3 ± 0.3 km/s, implying a comparably massive companion. The latest eclipse was in 2009—2011, and was widely observed by interferometry (CHARA), in the infrared spectrum, the far ultraviolet (HST/COS), and from ground-based sites by a worldwide campaign of amateur astronomers led Robert Stencel (U. Denver) and Jeff Hopkins (Hopkins Phoenix Observatory).

Epsilon Aurigea has also been widely observed photometrically and spectro-





Dr Phillip Bennett

scopically for the past 20+ years out of eclipse. Aside from the unusual nature of the companion, Epsilon Aurigae is of interest because it contains an apparently massive, high-evolved supergiant in a binary system, implying the possibility of determining accurate fundamental stellar parameters of the F star (a first for such a highly-evolved cool star).

In his talk, he discussed the current state of knowledge of the stellar and orbital parameters, the probable evolutionary state of the system, and the prevailing model of the dark companion of this peculiar binary.

At the end of the presentation Phillip Bennett was asked numerous questions, then Robert expressed thanks to the quest speaker for his informative and captivating presentation.

The evening closed with treats bought by Patrick Kelly, our National Representative. Member spent some in small talks before the meeting came to an end.

"Quick Tips"

Member's Astronomy Tips

Looking for an inexpensive cover for your large dob? This camping shelter is made of the same material as a "space blanket." but comes as a tube instead of a sheet.

Gather the tube at one end and tie it off securely with a length of the supplied cord, then turn it inside out (just for looks). Voila! you have a telescope cover for a large dob! Cut the remaining cord in two pieces for tying the cover around the telescope.

OK, its flimsy, but for $2 a pop you can afford a couple of spares! I have a mesh drawstring stuff

sack to store mine when not in use. (For some reason I have multiple mesh drawstring bags in the house!)

"***The Frugal Astronomer"***

Front Page Photo: Blair MacDonald

Object:	Jupiter
Exposure:	2400 frames of video
ISO:	3200
Camera:	Canon 60Da DSLR
Optics:	Eyepiece-projected using a 7 mm type 2 Nagler and a 200 mm SkyWatcher f/5 Newtonian reflector
Processing:	Video processing in Images Plus. Contrast enhancement, sharpening and saturation applied in Images Plus. Noise reduction done with Images Plus and Noise Ninja.
Location:	Bedford, Nova Scotia

HALIFAX CENTRE

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

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Nova Notes is published 5 times a year, in February, April, June/July, September/October and December.
The deadline for the next edition is January 15th 2013
The opinions expressed herein are not necessarily those of the Halifax Centre.
Articles on any aspect of Astronomy and Allied Sciences will be considered for publication.

Sketching

Quinn Smith / Michael Gatto

The following comments and sketches were originally posted on the Hfx "list" by Michael Gatto on Tuesday Nov 13th, right after the Werner "X" appeared on the Moon. I asked Michael if I could post them in Nova Notes to not only allow members to view Michael's amazing sketches in high resolution, but to encourage other members to try their hand at sketching.

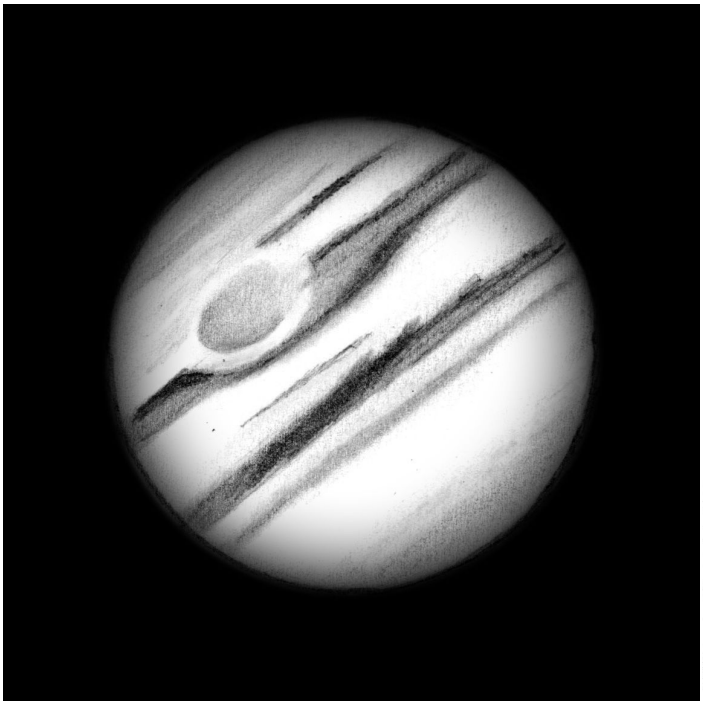
Very few of us are going to be able to match Michael's skill. However sketching has the tremendous side benefit of greatly improving a person's observing skills. One sees vastly more detail, and observes many more features, when (attempting) to sketch an object, rather than just "looking" at it.

My personal sketches look like they were drawn by a drunken ant, however sketching is always rewarding, and as I look back on my efforts, I see the ant is drinking less and less!

I encourage other members to give sketching a try and to send your efforts into Nova Notes. Don't be discouraged—if a drunken ant can produce an astronomical sketch, then anyone can!

Michael: "The seeing was actually quite poor for the Moon, plus it was low and I was looking over a roof. So when I swung the scope over to Jupiter I was surprised that the seeing was quite good — not dead steady but when it was good it was GOOD!

There were lots of moments that were very still and detail would come flooding in. The Great Red Spot was well defined at times, it was possible to trace the full outline of it, there was a very thin band above and to the right that really stood out. And the GRS itself was very low contrast (lower that it is represented here — for sure) and better defined on the W edge (left here). There were lots of details in the main EQ bands as well.



Here is a sketch, made at the eyepiece between 9:50 and 10:25 p.m. at 200x in an 8" Newtonian. (scanned and cleaned up in Photoshop).

I started out looking at the Lunar X, until it sank below a roof, this sketch was made at the eyepiece between 9:00 and 9:45 p.m., at 200x. This was as much as I could fit in during the 45 minutes I had available (there is so much detail on the Moon, even with crappy seeing). I darkened in the black areas when back indoors (scanned and cleaned up in Photoshop).

Featured Astro-photographer of the Month: Jeff Donaldson

Object: M52 and Bubble
Location: Shediac, NB Canada
Camera: Full Spectrum Honis Modified Canon XSi / 450D with MPCC
Filter: Baader 2" UV/IR Filter
Scope: Orion 8" f/4 Astrograph
Mount: Celestron CGEM
Guiding: None
Subs: 24 x 300s (5min)
Darks: 6
Bias: 25
Flats: 25
Dark Flats: 25
Captured with: BackyardEOS
Processed in: Pixinsight

I have always wanted to shoot this object and now that I bought a modified Canon 450, and sent it to Gary Honis for a full spectrum modification (I should have got the Baader mod because I have to use a color-correcting filter with my lenses). Still works great with an MPCC. This night was not a good night for guiding - I had my old guide mount setup and I was not able to get a guiding star - so I decided to play with 5 minute exposures without guiding, and this is what came out. It was my first real try at imaging an Hα object. I had a few setbacks with the processing and a few bad comments on cloudy nights from some members saying my interpolation was the worst they'd ever seen. Some nice members gave me pointers and I tried them and it worked! I have a tendency to try to make the background darker I backed off a bit and it turned out rather well and really good for a unguided image, in my opinion.

Object: M33
Location: Enfield, NS Canada
Camera: Full Spectrum Honis Modified Canon XSi / 450D with MPCC
Filter: None
Scope: Orion 8" f/4 Astrograph
Mount: Celestron CGEM
Guiding: Celestron Nexguider
Guide scope: Celestron 80mm guide scope.
Subs: 8 x 300s (40min Integration)
Darks: 6
Bias: 25
Flats: 25
Dark Flats: 25
Captured with: BackyardEOS
Processed in Pixinsight

I really enjoyed shooting this one, everything just worked, I have the Sky Align routine down pat - guiding with my new 80 mm Celestron guide scope package is a lot easier now with the official Celestron rings. My chinese made camera remote is making my camera do unusual things so I have been using my laptop with BackyardEOS on it and Teamviewer (Which is nice and I will explain why in a moment). It was early in the morning or late at night depending on how you look at it when I was imaging M33 when I heard a scuffle in the woods. It wasn't a deer, beaver, coyote, raccoon kind of noise it was a loud breathing noise and a loud thump I felt under my feet. Now we don't normally have bear or moose around and being both are very aggressive I decided to move myself inside and used my desktop to remote into my laptop. I wasn't sticking around to find out. What I am proud of in this image is that I had issues getting the color balanced right - I used a custom white balance using a gray card and my images always looked red when I used DSS to stack. Blair told me about using the setting that is off by default that tells DSS to use in camera white balance. That made all of the difference! Blair taught me everything I know about astrophotography.

Cosmic Debris

Odds and Sods from the world of astronomy and astrophysics

NASA News: The Diner at the Center of the Galaxy (Nov. 22, 2012)

Deep in the heart of the spiral Milky Way galaxy, a hot vortex of matter swirls around a black hole more than a million times as massive as the sun. Many galaxies, perhaps all, contain such a "monster in the middle." These supermassive black holes sustain themselves by swallowing stars, planets, asteroids, comets and clouds of gas that wander by the crowded galactic core.

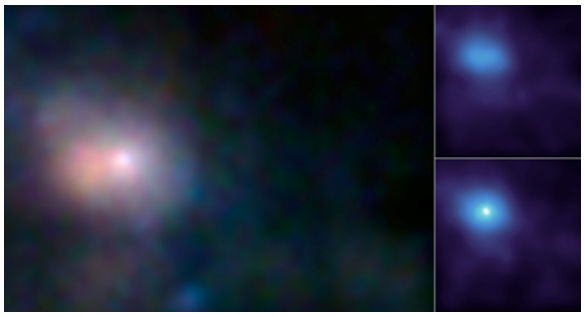
NASA's NuSTAR spacecraft recently caught the Milky Way's central black hole in the act of having a snack.

"We got lucky and captured an outburst from the black hole during our [first] observing campaign," says Fiona Harrison, the mission's principal investigator at the California Institute of Technology.

NuSTAR is an orbiting observatory designed to take pictures of violent, high-energy phenomena in the universe. Launched on June 13, 2012, it is the only telescope capable of producing focused images of the highest-energy X-rays produced by dying stars and ravenous black holes.

"It's like putting on a new pair of glasses and seeing aspects of the world around us clearly for the first time," says Harrison. NuSTAR's first light image of Cygnus X-1, a black hole in our galaxy that is siphoning gas off a giant-star companion, shows what she's talking about (see inset).

NuSTAR's sharp vision allowed it to pinpoint a burst of hard X-rays coming from the galactic center during an observing campaign in July. Lower-energy X-ray observations by NASA's Chandra X-ray Observatory and infrared data from the Keck telescope in Hawaii confirmed the outburst. The Milky Way's black hole had just swallowed ... something.



NuSTAR image of an X-ray burst in Cygnus X-1

Black hole snacks are a violent process in which the "meal" is ripped apart by powerful tides and heated to millions of degrees as it slides down the gullet of the gravitational singularity. In this case, NuSTAR picked up X-rays emitted by matter being heated up to about 100 million degrees Celsius.

The observation raises hopes that astronomers will be able to solve a long-standing mystery: Why is the Milky Way's supermassive black hole such a picky eater?

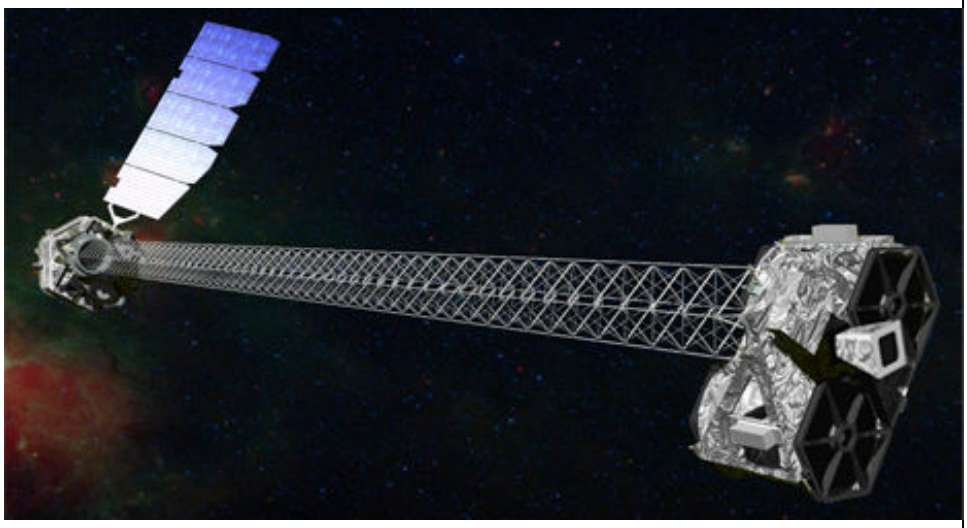
Compared to giant black holes at the centers of other galaxies, the Milky Way's is relatively quiet. More active black holes tend to gobble up matter in prodigious quantities. Ours, on the other hand, is thought only to nibble or not eat at all.

Asteroids could be a primary food source. One model holds that trillions of asteroids surround the Milky Way's core. Astronomers using the Chandra X-ray Observatory have indeed detected flares consistent with asteroids 10 km wide or larger falling into the black hole. These space rocks would be about the same size as the asteroid that wiped out the dinosaurs on Earth 65 million years ago. Smaller space rocks might be falling in, too, but their flares would be too weak for Chandra to detect.

NuSTAR brings something new to the problem. With its unprecedented ability to detect and make focused images of X-ray flares, the telescope will almost certainly help astronomers understand what's happening deep in the core of our galaxy. The monster's menu might soon be revealed.

For more information about NuSTAR and its focused observations of black holes, visit the mission's home page at ***nustar.caltech.edu.***

Author: Dr. Tony Phillips| Production editor: Dr. Tony Phillips | Credit: Science@NASA



Artist concept of the NuStar X ray telescope in orbit. Credit: NASA