

Nova Notes

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



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Volume 40 Number 4 October 2009

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In this issue:

Meeting Announcements	2
NOVA Program	3
Imager's Corner	4
Astro Photos	5
Nova East Report	6/7
September Meeting Report	8/9
IYA Update	10
Cosmic Debris	11
St. Croix Observatory	12

Front page photo: Greg Parsons

Comet C/2006 W3 Christensen

Taken on Sept 6th 2009 with a Canon XSI camera at prime focus, 6.3 focal reducer, on a 10" Meade LX200



From the editor

Quinn Smith

It is with great sadness that I must report the death of fellow amateur astronomer and fisherman, Scott Clarke. On September 20th, Scott was lost at sea in a tragic fishing accident south of Halifax. Scott has attended several Nova East Star Parties and had also been to Centre meetings with Clint Shannon. Although not a member, Scott was a friend to many members of the Halifax Centre, and our condolences go out to his family and friends. John Nangreaves said it best "If it's true Scott had salt water in his veins, so it is true he had stars in his eyes. So rest in peace Scott. We hope you find your buddy Clint and a Universe of stars to explore."

In this edition you will find a summary and acknowledgement of some of the IYA events that have taken place this summer. You will also find a review of our Nova East Star Party - another one for the books! We were really blown away by this one. You will also find a new and (hopefully) regular feature "Imager's Corner" written by our photo wizard Blair MacDonald.

I had mentioned in my last editorial that I had visited the Mount Wilson Observatory in Los Angeles. While I was there I asked about the fire risk and was told that it did not pose a serious problem. After all, I was told, the Observatory was a hundred years old. That was in April, and this August I watched in horror as firefighters hosed down the observatory buildings as fire raged all around the Mountain. The observatory was saved, but only just.

Meeting Announcements

Meetings begin at 8:00 p.m.

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

Meetings take place in room SB260, Sobey Building (#2 on map) at Saint Mary's University.

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.

Executive meetings begin at 7:00 p.m., (usually in room SB152), and all members are welcome to attend.

Meeting room SB 260

October 16th, 2009 - Meeting night
Pat Kelly will present the popular game show:
“Who wants to be a Gazer?”

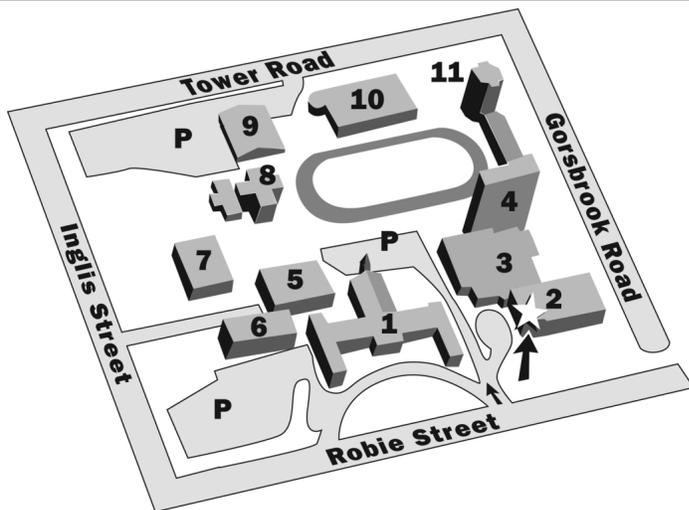
November 20th, 2009 - Speakers night
Dr Roy Bishop will discuss the optics of the Galilean Telescope as first used in the 1600's.

December 18th, 2009 - AGM
This is the Annual General Meeting of the Halifax Centre.
Guest speaker Hugh Thompson will talk about his current project, the Thirty Meter Telescope.

[The content of all meetings is subject to change]

Meeting Location:

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
- P Parking



Halifax RASC Executive, 2009:

Honorary President	Dr. Roy Bishop	902 542 3992
Acting President	Wes Howie	252-9453
2nd Vice-President		
Secretary	Chris Young	466-0489
Treasurer	Pat Kelly	472-2322
Nova Notes Editor	Quinn Smith	852 3894
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Librarian	Robert Bussieres	434 4821
Observing Chair	John Liddard	902 865 7607
Councilor	Paul Heath	457 0610
Councilor	Sean Dzafovic	430 9062



Nova Program

Sean Dzafovic

The Halifax Centre of the RASC is pleased to offer its version of the popular NOVA Program (New Observers to Visual Astronomy) originally developed by the Prince George Centre.

This program is intended to provide new members of the Royal Astronomical Society of Canada, or anyone interested in astronomy, with basic astronomy knowledge and skills to enable them to become proficient amateur astronomers and to foster an environment wherein new members may quickly become active, participating members of the Society.

Participants in the NOVA Program will receive a copy of the Beginner's Observers Guide, and a copy of the printed course materials. Over the length of the course, the students will be walked through completion of the RASC's Explore the Universe Certificate, which will provide an observer with an introduction to the various aspects of astronomical observing, from lunar observing to deep sky objects.

The program consists of 9 lessons, each of which covers different aspects of amateur astronomy. Each lesson will consist of a lecture, with videos and other demos to clearly explain the various concepts. The cost for the course is \$60, which covers the course material provided (lesson plans plus the Beginner's Observing Guide).

The course will begin in October at St Mary's University date, time and room # to be announced).

Please contact: Sean Dzafovic at sdzafovic@gmail.com or post to the Halifax list for more information.

For more information on the RASC's Explore the Universe Certificate go to: <http://www.rasc.ca/eu/>

Course outline (subject to change):

Lesson 1 – Observing

How to prepare for an observing session, complete an observing log and the basics of lunar sketching.

Lesson 2 – Motions of the Sky and Seasons

Apparent motion of the stars across the sky, the changing path of the sun and why we have seasons.

Lesson 3 – Maps, North, Distance, Position and Brightness

Star maps, finding north, measuring distance, location systems (altitude) and magnitude of sky objects.

Lesson 4 – Telescope Types and Using Them

Telescope types, mounts and accessories, techniques for using your telescope (aligning a finder-scope, polar alignment, etc.)

Lesson 5 – Star Designations, RA & Dec, Deep Sky Objects

Common star designations, RA/Dec coordinate system, different types of deep sky object.

Lesson 6 – The Moon & Eclipses

Moon Phases, lunar and solar eclipses, tides

Lesson 7 – The Solar System

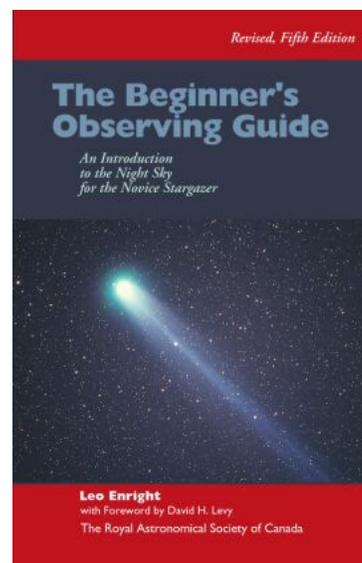
Solar system formation & scale, observing the planets

Lesson 8 – Stars

Types of stars, temperature and colour of stars, stellar life cycles

Lesson 9 – Course Windup and Observatory Orientation

Orientation to the St. Croix Observatory and receive course certificates



HALIFAX CENTRE

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

Deadline for the next edition is November 23rd 2009.

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

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Newsletter editor: Quinn Smith



Blair McDonald

For those Red Green fans in our readership, consider this column the astro-photographer's version of Handy Man's Corner without the duck tape. Our illustrious editor put out the call for articles to fill the pages of Nova Notes and I have been receiving a few requests for information so I thought I'd combine the two into this column. Schedule permitting, I'll try to answer some of the questions as they come in and I'll publish a few along with the answers in this column.

Remember, this column will be based on your questions so keep them coming or I'll have to make them up! You can send them to hfxrasc@lists.rasc.ca or send them directly to me at b.macdonald@ns.sympatico.ca. Put "IC" as the first two letters in the topic so my email will sort the questions.

This question for this edition is "What is image calibration and how is it done?" The answer to this one is, as usual, simple and very complex. The simple answer is the one we will concentrate on here as it provides the most insight into what's going on with the process. First, calibration is simply correcting the image data for imperfect detectors and optics. It's the first step in the image processing before stretching, flattening or noise reduction.

Step one is to remove the *dark signal* from the image. You will notice that I used the term signal and not noise as it is commonly referred to in most camera literature. Noise, in the signal processing sense, is a random variation in the data; there is nothing random in the dark signal (not quite true, but more on that latter). The dark signal comes about because of thermally induced currents in the detector chip. At

any given temperature a pixel will accumulate a certain amount of electrons due to this current and it varies slightly from one pixel to the next. The only way to stop this signal is to cool the detector chip. This signal reduces with temperature and will disappear completely at 0 degrees Kelvin (this is why mode astro-only CCD cameras are cooled).

The good news here is that this signal is almost (notice I said almost) totally predictable. By taking a dark frame, which is an exposure of the back of your lens cap (i.e. no light reaching the detector), and subtracting it from the light frame (the image data) this dark signal can be removed. This works because the pixels collect the same amount of dark signal as they did during the light frame, so simple pixel by pixel subtraction removes it. This is what most digital cameras do for long exposure noise reduction.

Now for the bad news! There is a random component to the dark signal. This is the actual noise and it varies with each exposure. Its magnitude is approximately equal to the square root of the number of electrons of dark signal collected during the exposure. This is true noise, and subtraction will not remove it. The longer the exposure the worse it gets and it is why it is not a good idea to simply subtract a single dark frame from a single light frame. Instead you should always make a master or average dark frame from many individual darks. As you average the dark frames, this noise reduces with the square root of the number of darks in the average. If you use this master dark frame for dark correction then you add less noise to the resulting light frame producing a much better image in the end.

Many people compare the dark signal to film grain. It's not really a good comparison as the film grain varies shot to shot and cannot be removed by subtracting one negative from another. Chalk one up for digital imaging (I can hear the protests from the purists!) I've skipped bias calibration in this discussion because the bias signal is

included with the dark frame. Bias is a signal that shows up in each pixel due to electrical bias currents in the semiconductor junctions of the detector. It is constant with exposure time and temperature and even shows up in a zero second exposure. The solution here is to simply take a series of very short exposures (as short as your camera can manage) average them to reduce that pesky noise and then use this master bias frame to subtract the bias signal from both the dark and the light frame. You can simply subtract the dark and the bias is automatically removed, but the bias frame becomes important in the next step, flat field correction.

Flat fields are used to correct for pixel to pixel sensitivity differences and as a bonus it also corrects for some optical problems. The idea here is that if you take an image of an evenly illuminated flat white card (or the sky) then the image should have all the pixels set to the same value. Unfortunately, all the pixels on the chip do not have the same sensitivity so the image will have variations in the pixel values that map to the differences in sensitivity. If you simply divide the dark corrected image by the flat field the effect of this varying pixel sensitivity is removed.

One note here, the bias signal should be removed from the flat field and if the exposure is long enough to have significant dark signal, it should be removed as well. Generally the flat field is normalized to some value, if floating point math is used then you simply normalize to the brightest pixel. If your optics vignette or if there are dust bunnies on your optics, then these reduce the amount of light making it to the sensor and it looks like a sensitivity change so a flat field can correct for these problems as well.

That is really all there is to it. Calibration allows the astro-imager to remove much of the non-ideal response of the imaging sensor from the image. This allows follow-on processing to correct colour, brightness and contrast of the image to get that pretty picture we all want to hang on the wall. [end]

Astro-photos from Halifax Centre members



Photo above - Mike Boschat : ISS and Discovery
September 8th 2009 @ 8:34pm ADT, shuttle Discovery ahead of ISS. Going through Aquila.
Canon 350D lens at about 25mm, 25 sec exp, f/5.0, 400 ISO



Photo above - Michael Boschat: Sunspots (finally!)
Halifax, Nova Scotia, September 23, 2009 @ 1310 UT
Telescope: Celestron C8, 2000mm fl, f/10
Medium: Centrios 3.0 MP DSC-3020 Digital Camera
hand held over 40mm Plossl eyepiece (50x).

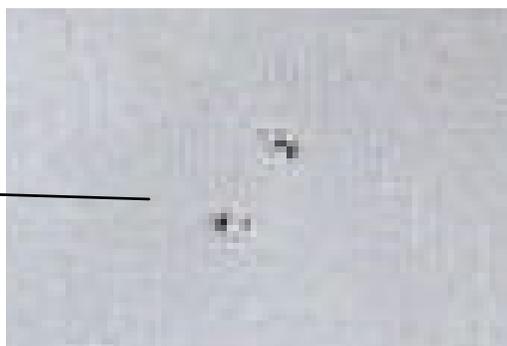


Photo right - Robert Bussieres: Galileo at Nova East
The surprise appearance of Galileo at Nova East.

The talk was so inspirational that the Park asked us to close down NE immediately after the presentation!



Nova East Report

Roy Bishop

Nova East 2009 Unusual Weather and an Unusual Group

Nova East 2009 was held on the weekend of August 21–23 . . . sort of! For the third year in a row, Murphy (of Murphy's Law) interfered. Nova East 2007 was wet. In 2008 Murphy brought more rain, with lightning to cap a tidal bore tour. This year Nova East started off dry. Had Murphy forgotten us? No. He had other plans. Saturday was warm and sunny, but at noontime we were told to vacate Smiley's Provincial Park by 5 p.m. in advance of Hurricane Bill (now a tropical storm), which on Sunday lashed the province with wind and rain. Of course the week preceding Nova East had been sunny, and so were most days during the three weeks following Nova East — typical late summer weather in Nova Scotia, but thanks to Murphy, the weather on the weekend of Nova East was unusual!

Despite the early termination of Nova East 2009, the greater part of the program took place. Dr. David Turner, our guest speaker, started the things off Friday evening with a fascinating account of the North Star. The sky was overcast following Dr. Turner's talk; however, on an outdoor screen an IMAX DVD movie "Space Station 3D" (in 2D!) was enjoyed by all. Special thanks to Wayne Harasimovitch and Smileys Park for that addition to the program.

A highlight this year and the first-ever such event for Nova East was a live radio contact with Canadian astronaut Dr. Robert Thirsk on the International Space Station as the ISS passed over Nova East for several minutes just before 10 a.m. on Saturday morning. The contact was made possible through the international educational outreach program called ARISS (Amateur Radio on the International

Space Station) and the cooperation of the space agencies of Canada, the United States, Russia, Europe, Japan, and the crew members on the International Space Station. We are indebted to Halifax Centre member Wayne Harasimovitch for proposing the contact, and for his unremitting efforts and planning over three months to make it happen. Thank you Wayne! Special thanks also to Wayne's ground support team from the Halifax Amateur Radio Club.

During the ISS contact several individuals spoke with Dr. Thirsk, asking him questions related to the ISS and life in space. The questions had been submitted several weeks earlier, approved by NASA, and transmitted to Dr. Thirsk for his information. Those who spoke with Dr. Thirsk were: Dave Chapman, Carlotta Cummins, Sean Donovan, Tim Donovan, Paul Heath, Patrick Kelly, Murray Nicholson, William Place, Quinn Smith, Mary Lou Whitehorne, and three people who filled in for Andrew Robertson who was unable to be present (one of the three was Pat d'Entremont, and I apologize for not knowing the names of the other two). Dave Lane, RASC National President, closed off the contact as the ISS passed beyond our eastern horizon.

Events went like clockwork until late Saturday afternoon when the Nature Walk (by Sherman Williams), the Tour of St. Croix Observatory (by John Liddard), and a talk about the Galilean Telescope (by myself) had to be cancelled because of the hurricane-induced closure of all provincial parks in the province.

Despite its laid-back atmosphere, Nova East does not just happen. It is a result of planning and work by many people. Special recognition is due to the Nova East 2009 Committee:

Pat d'Entremont: (Door Prizes)
Blair MacDonald: (Nova East Registrar, and speaker)
Ron Mills: (Program assistant, Event Tent coordinator, moving equipment

from SCO, contact with Smileys Park, Breakfast planner)
Irene Moore: (Nova East webmaster)
Dave Parsons: (Consultant — Dave knows everything about Nova East)
Don Wright: (the Committee chef)

And to:
Chris Beckett (Advice on door prizes)
Wayne Harasimovitch (ISS contact)
Paul Heath (Sky Tour host, and speaker)
Pat Kelly (Treasurer)
Dave Lane (technical assistance)
John Liddard (Tour of St. Croix Observatory)
Andrea Misner (President of the RASC Halifax Centre, until August)
William Place (moving equipment from SCO)
Quinn "Galileo" Smith (IYA Chair for the Halifax Centre, and speaker)
Dr. David Turner, our 2009 Keynote Speaker
Gary Weber (Bannock chef)
Sherman Williams (Tidal Bore Tour host, and Nature Walk host)

Also, Rick Folker and Art Cole, supervisors of Smileys Provincial Park, must be mentioned for being so helpful and accommodating. Rick remarked that ours is the one group that is not a problem for the Park staff. We are an unusual group. We don't get drunk and noisy, disturb other campers, destroy Park equipment, or leave a mess behind us. Moreover, each year Nova East attracts the largest number of campers to Smileys Park.

From a personal point of view I would like to thank all those who both organised, helped out, presented and attended Nova East.

If you would like to know more about the ISS contact here are a couple of links:
www.bellaliant.net/spacestation
<http://spaceflight.nasa.gov/station/reference/radio/>

Editor



Above: Checking the radio equipment prior to the ISS contact.



Above: The radio antenna is raised into position for the ISS contact.



Left: Waiting for the tidal bore



Group photo from Nova East 2009 - nice tee shirts!



John Liddard & the "Thunder Dome"



Bannock breakfast is served!

September Meeting Report

Quinn Smith

The September meeting was opened by Wes Howie our 1st VP. Our President Andrea Misner had to step down in July as she has moved from Halifax to Winnipeg. Wes will take over the President's duties until we elect a new President in December.

Wes opened the meeting and greeted the 44+ attendees. Wes welcomed the 8 non RASC members and after handing each of them a RASC introduction package outlined the benefits of membership.

Wes pointed out that there will be Executive elections in December (at our AGM) and that positions of President and Treasurer (at least) will need to be filled. Anyone interested should contact any Exec. Member (see page 2).

Quinn gave a brief outline of the IYA activities that have taken place over the summers and asked the members to thank those who organized and took part in these events (see page 10). Quinn also introduced the finally acquired "Galileoscopes. The Centre has purchased 25 of these 'scopes for purchase by members, schools and youth groups for use with public outreach. They are \$25 each (great value) and if a teacher or organization cannot truly afford a 'scope the Centre will donate one. If you know of a group that could use a 'scope tell them to contact Quinn at quinnjem@yahoo.com.

Sean Dzafovic then spoke about the NOVA Program that will be offered by the Centre this Fall. Details can be found on page 3.

Then it was Robert Bussieres' turn to outline his plans for a 'secret' Astronomer's Code that members can include in their correspondence. As always Robert had the room in tears of laughter as most of us tried to keep up with him. Details will be posted on the "List".

Wes then introduced our speaker for the evening, Blair McDonald. Blair's topic for his talk was "Adventures in Astrophotography".

Blair started his talk by noting that his progress in astrophotography reflected the changes that had occurred in astrophotography technology. He started in this hobby when "fast" film was easily available, moving through CCD imaging and auto-guiding, to his current use of DSLR cameras.

Blair explained that his first 'scope was a 4.5" Tasco reflector which was given to him by his wife for Christmas in 1989. According to Blair, she has never forgiven herself for starting Blair on the road of astronomy and astrophotography. His first attempts of photography were taken with a film camera through the Tasco and often required exposures of over an hour. These long exposures were guided by hand, often with Blair laying on the ground looking through a second guide scope to track the object he was photographing.

Blair showed a photo of Jupiter showing multiple "dust" moons and it was during this time that he discovered the concept of "averted imagination". A term he often uses to describe astronomical objects imagined but not real (I've had a few of those! Ed.)



The "famous "Red Tasco" 'scope



Blair's current set-up

Blair outlined the advantages and disadvantages of his Tasco. Shaky mounts, poor eyepieces, and a narrow field of view being some of the disadvantages. However he used the 'scope often enough to be known as "The Tasco Guy".

His first major upgrade was to purchase a Meade 8" Schmidt - Newtonian reflector. This was to begin Blair's love/hate relationship with Meade (Blair says mainly hate!). At this point Blair was still using film to capture the images.

Before moving on to tell us about his move to a CCD camera Blair discussed some of the "wild life" that shared his observing sessions. Rabbits, raccoons, coyotes, and of course the famous "killer" deer of St Croix.



Blair's next upgrade was to a Meade CCD camera. Let's just say that the transition was not as smooth as he would have liked, and the love/hate relationship with Meade was more hate, not so much love. However slowly Blair worked out the "bugs" in the system and was rewarded with some amazing CCD images.

The CCD camera is very sensitive allowing shorter exposures than film, but the image size was small. Blair developed software to allow him to make mosaic images covering large areas of the sky. The images were also in black and white. Colour images required three sets of images (red, blue and yellow filtered) to be combined. A slow and tedious process.

Blair's next upgrade was to a Meade GEM mount. I cannot publish some of the words Blair used to describe his now no love/all hate relationship with Meade. Put it this way, when Blair calls Meade Well you can imagine. Blair finally got the new mount working and managed to couple it to

an auto guider (with again his share of problems). Blair's photography with his setup was truly amazing - but he wasn't finished yet.

His most recent upgrade is to a Canon digital single lens reflex camera (DSLR). This was a love/love relationship from the start, and with its colour format and large frame Blair has taken some truly outstanding images.

Blair ended his talk by summarizing the pros and cons of the three formats that he used to make images.

Film:

- Inexpensive
- Low SNR
- Low resolution (at least in fast film)
- Limited ability to process image
- Poor H α sensitivity

CCD:

- Expensive

- Excellent SNR
- Medium resolution (in affordable models)
- Excellent H α sensitivity
- Colour imaging a tedious

DSLR:

- Medium cost.
- Medium SNR - requires longer exposures than CCD
- High resolution
- Medium H α sensitivity
- Wide field imaging
- Full colour imaging

There were many questions at the end of his talk and Wes had to close the discussion to keep the meeting to a reasonable 90 minutes. The evening ended with munchies and continued discussions about all things astronomical.

All in all an informative, and very enjoyable evening.

Film



All photos in this article courtesy of Blair McDonald



Three images of the Horse Head Nebulae

Above: Film
 Top right: CCD
 Lower right: DSLR



DSLR

IYA Update

Quinn Smith

It has been an amazing summer of IYA events in Nova Scotia, and I want to thank everyone who participated in these events. I want to especially thank Karl Penny and Dave Chapman (fellow IYA committee members) who have both put in an enormous amount of work and dedication in supporting and organising IYA events.

What follows is an attempt to acknowledge the commitment of members and to list the events of the summers activities. I offer my apologies upfront for omissions, errors and general “screw ups”. Please contact me and I will correct.

Planetarium:

Thanks to Chris Young and John Liddard who have both put on several Planetarium shows over the summer.

Library talks:

June 6th	- Dave Chapman	How High is the Sky?
June 24th	- Andrea Misner	Observing for Beginners
July 28th	- Andrea Misner	Gravity and Black Holes
Aug 5th	- Dave Chapman	Meteor Observing
Aug 20th	- Paul Heath	Astro Workshop
Aug 27th	- Paul Heath	Introduction to Astronomy
Sept 12th	- Paul Heath	The Universe: Yours to Share
Sept 15th	- Quinn Smith	How High is the Sky?
Sept 23rd	- Ron Mills	The Night Sky for Beginners
Sept 26th	- Paul Bowman	The Hubble Telescope
Sept 30th	- John Nangreaves	The Night Sky for Beginners

Other Events:

- June 5th - 6th Story Telling Symposium Sydney Cape Breton - various presenters.
- June 9th – planetarium shows - The Admiral Digby Museum, Digby - Science East (based in Fredericton, NB).
- June 14-21 - Silver Dart Centennial Alexander Graham Bell National Historic Site, Baddeck, NS - Karl Penny and Tim Donovan.
- July 17 - Astronomy at Dollar Lake - Dollar Lake Provincial Park, Middle Musquodobit, NS - Karl Penny.
- July 25th - Astronomy at Kejimikujik National Park - Jerry Deveau, Wayne Mansfield, and John McPhee.
- July 31 - Aug 1st - A guided walk among the stars - Graves Island Provincial Park, Lunenburg County, NS - Mary Lou Whitehorne.
- Aug 8 - Busking Astronomers - Halifax Waterfront - Karl Penney, Dave Chapman, Marcin Sawicki, and Mark Dryden.
- Aug 8th - Public Observing at Mira Park, Cape Breton, NS - Tim Donovan.
- Aug 11th - Light pollution discussion - Breakfast TV (CTV) - Quinn Smith.
- Aug 12th - Meteor Watch - Mira Park, Cape Breton,

NS - Tim Donovan and Blair MacDonald.

- Aug 12th - Observing Summer Constellations - Dollar Lake, Musquodoboit – Ron Mills.
- Aug 15 - Star Party - Cape Breton Highlands National Park, Ingonish, NS - Tim Donovan, Galen Thurber, and Prune Harris.
- Aug 17 - 18 - Public Observing - Bell Museum, Baddeck, NS - Tim Donovan + others
- Aug 21 -23 - Nova East Star Party - Smileys Park - Halifax RASC + Minas Astronomy Group.
- Aug 24 - The Summer night Sky - Kejimikujik National Park, NS - Dave Chapman.
- Aug 25-28 - Public Observing - Kejimikujik National Park, NS - Dave Chapman & Karl Penney.
- Aug 27th - Sky Tour - Taylor Head Provincial Park, Eastern Shore, NS - Ron Mills & Gilles Arsenault.
- Aug 27th - Light Pollution and Dark Sky Preserves - Mersey Tobeatic Research Institute - Quinn Smith.
- Sept 6th - Astronomy Talk and Public Observing - Thomas Raddall Provincial Park, Liverpool, NS – Wayne Mansfield and helpers.
- Sept 9th - Commemoration of First Observatory in Canada - Fortress of Louisberg, Sydney, NS - Tim Donovan, Stan Williams, and Ken Donovan.
- Sept 11th - Navigating by the Day or Night sky - Lawrence House Museum - Maitland - Roy Bishop.
- Sept 12th - Shadows of Sept 9th Minas Astronomy Group - Roy Bishop and Larry Bogan.
- Sept 17th - Progress 101 awards - Halifax - Quinn Smith.
- Sept 19th - Observing at Dollar Lake - Karl Penny, Dave Chapman, Blair MacDonald, and Jeff Donaldson.
- Sept 25/26th - Sidewalk Observing - Keshen Goodman Library, Halifax, NS - Karl Penny and RASC members.
- Sept 25/26th - Sidewalk Observing – Chapters Mic Mac, Dartmouth, - Jeff Donaldson and RASC members.

Upcoming events: Galilean Nights (October 22-24)

- **22nd** - Dave Lane & Doug Pitcairn - Maritime Noon phone in. Dave Chapman - Breakfast TV - “How to choose a telescope” Planetarium Show - Dalhousie University 7:15 p.m. Public observing by RASC (Chapters / Bishops Landing)
- **23rd** - Galilean Lecture Series - Dalhousie University Dunn Building The Guptill Lecture Theatre at 7:30 p.m. Prof. Christine D. Wilson “Beyond the Visible Universe: Galaxy Collisions, Star Formation and Galactic Evolution” Public observing before the lecture at Dalhousie and at Bishops Landing and Chapters afterwards.
- **24th** - Astronomy Café at Café Ristretto (Bishops Landing) at 7:30 p.m. “Conversations with Amateur Astronomers” followed by public observing.

Please check www.astronomynovascotia.ca for more details of our observing events as locations as times may change.

Cosmic Debris

Odds and sods from the world of Astronomy and Cosmology

Rocky Extrasolar Planet found.

By Seth Borenstein, Wed Sep 16 (Associated Press)

Astronomers have finally found a place outside our solar system where there's a firm place to stand - if only it weren't so broiling hot.

As scientists search the skies for life elsewhere, they have found more than 300 planets outside our solar system. But they all have been gas balls or can't be proven to be solid. Now a team of European astronomers has confirmed the first rocky extrasolar planet.

Scientists have long figured that if life begins on a planet, it needs a solid surface to rest on, so finding one elsewhere is a big deal.

"We basically live on a rock ourselves," said co-discoverer Artie Hatzes, director of the Thuringer observatory in Germany. "It's as close to something like the Earth that we've found so far. It's just a little too close to its sun."



An artist rendition of the first rocky extrasolar planet called Corot-7b. European astronomers confirmed the first rocky extrasolar planet Wednesday.

So close in fact, that its surface temperature is more than 3,600 degrees Fahrenheit (2,000 Celsius), too toasty to sustain life. It circles its star in just 20 hours, zipping around at 466,000 mph (750,000 kph). By comparison, Mercury, the planet nearest our sun, completes its solar orbit in 88 days.

This is a major discovery in the field of trying to find life elsewhere in the universe, said outside expert Alan Boss of the Carnegie Institution. It was the buzz of a conference on finding an Earth-like planet outside our solar system, held in Barcelona, Spain, where the discovery was presented Wednesday morning. The find is also being published in the journal *Astronomy and Astrophysics*.

The planet is called Corot-7b. It was first discovered earlier this year. European scientists then watched it dozens of times to measure its density to prove that it is rocky like Earth. It's in our general neighbourhood, circling a star in the winter sky about 500 light-years away.

In addition, the planet is about as close to Earth in size as any other planet found outside our solar system. Its radius is only one-and-a-half times bigger than Earth's and it has a mass about five times the Earth's.

Now that another rocky planet has been found so close to its own star, it gives scientists more confidence that they'll find more Earth-like planets farther away, where the conditions could be more favourable to life, Boss said.

"The evidence is becoming overwhelming that we live in a crowded universe,"

[1] UCLA Department of Physics and Astronomy Aug 30 09 20:17:00



Fire on Mount Wilson: Sunday, August 30th, 20:30 PDT:

Posted by Ian O'Neill in Breaking news on August 30th, 2009 at 8:48 pm

According to the Mt. Wilson Observatory fire updates, fire crews have decided to remain at the summit of Mt. Wilson to fight the Station Fire blaze overnight.

There were concerns this evening that the conditions would be too treacherous for the fire fighters to remain behind, but it would appear this has changed.

But the fire continues and Mike Brown, an astronomer who lives near (but doesn't work at) Mt. Wilson, reported "*Holy smokes; massive glowing plume tonight just west of Mt. Wilson is scarier than last nights 50 ft flames.*"

Unfortunately, in another location, two fire fighters had tragically lost their lives fighting a blaze in Acton. **According to reports from @CalFire-News and the LA Times** the fire fighters were involved in an accident where their vehicle apparently rolled over a mountainside. The accident happened during a period of intense fire fighting.

Thanks to the heroic efforts of the fire fighters the observatory and telescopes were saved from the fire. This was a close call! Ed.



St. Croix Observatory

Observing Chair: John Liddard 902 865 7607

Part of your membership in the Halifax RASC includes access to our observatory, located in the community of St. Croix, NS. The site has grown over the last few years to include a roll-off roof observatory with electrical outlets, a warm-room and washroom facilities. Enjoy dark pristine skies far away from city lights, and the company of like minded observers searching out those faint “fuzzies” in the night.

Observing Nights:

Every weekend closest to the new Moon, there is an “Observing Night” at St. Croix. The purpose of “Observing Night” is to encourage Centre members, their guests and visitors to share an evening of observing at St Croix. 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 Chair.

Future dates for Observing Nights:

October	23rd, 2009
November	13th, 2009
December	No Observing night
January	16th 2010

These dates are all Fridays. If this is a meeting night, or cloudy, the alternate date will be the following Saturday.

Directions from Halifax:

- 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, may gain access to the St.Croix facility. For more information on becoming a key holder, contact the Observing Chair.

Rules for using the SCO equipment:

There are several pieces of astronomical equipment available for members (and guests) to use, including a 17.5” dob and a magnificent pair of tripod mounted, 100mm binoculars. If you are unfamiliar with the use of these pieces of equipment, please ask for assistance—any knowledgeable member would be more than willing to help you out. Please ask before using laser pointers - other members may be taking astro-photos. Please share the equipment with other members; and treat the equipment, the facilities, and the site with respect.
..... Enjoy!