Nova Notes

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

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YOUR FALL MEGA ISSUE: ECLIPSE EXPERIENCES AND STAR PARTIES

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DAVE CHAPMAN REPORTS ON THE AUGUST (P7) AND SEPTEMBER (P16) KEJI DARK-SKY WEEKENDS

FOR THOSE WHO MISSED THE SEPTEMBER RASC MEETING, CHRIS YOUNG FILLS YOU IN ON WHAT HAPPENED (P10).

September/October 2017

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 expanded over the last few years and includes a roll-off roof observatory with electrical outlets, use of the Centre's new Go-To 400-mm Dobsonian telescope and 100-mm 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 or Saturday backup) are open to both members and their guests. If you are not a key holder and would like to become one, or need more information, please contact the SCO Manager, Tony McGrath.

Upcoming Observing Nights:
November 18 (alt 19)
December 15 (alt 16)

Meetings usually begin at 8:00 p.m. at Saint Mary's University in Room 101 of the Atrium Building (AT).

All meeting locations and presentations subject to change

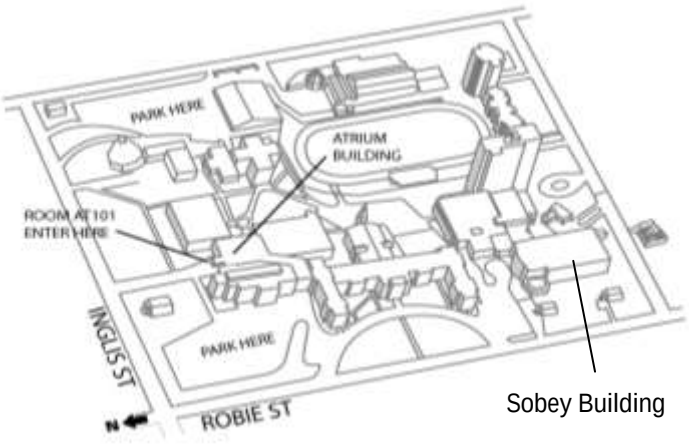
Meeting Dates for 2017/18

November 17, 2017
December 8, 2017 (AGM)
January 19, 2018
February 16, 2018

Meeting Location:

Saint Mary's University

Atrium Building (AT)
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.

Executive meetings begin at 6:45 p.m., usually in room AT306, and all members are welcome.

Halifax RASC Executive, 2017:

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Cover Photo

Blair MacDonald

Photo of Moon eclipsing the Sun. August 21, 2017, 1/1000, ISO 100, Canon 60Da DSLR, Prime focus of Sky Watcher Esprit 120 f/7 APO refractor, Dartmouth, Nova Scotia. The images were processed entirely in Images Plus. Conversting from Canon Raw, stretching using levels, and sharpening using statistical difference tool.

In this issue:

From the Editor—Well, I had an astronomy filled summer thanks to the likes of Dave Chapman who set up two Dark-Sky weekends and Judy Black and Melody Hamilton who organized Nova East. Paul Gray motivated a number of our members to go south to view the eclipse. Many others stepped up to the plate to support these leaders in organizing these events and to create their own events throughout the summer. I am happy to say that we have captured many of these moments in the personal stories and photographs contained in this issue.

I didn't travel south for the eclipse but still experienced it similarly to others. I set up a telescope with a Sun funnel and had a half dozen guests viewing the eclipse. During that time I was taking 126 photos of the eclipse through my 80-ED. I am in the process of turning them into a movie for use in my SCANS astronomy classes. There is so much to do and experience as an amateur astronomer, and it just keeps getting better.

Tony Schellinck

▲ Photo 78 of 126 taken during the 2017 eclipse. (*Photo: Tony Schellinck*)

Standing in Shadow

We dart into Shadows cool
To hide from the Unlidded Eye
We slide into Shadows
Upon the hunt, concealed.
We evaded Shadows, darkly
For fear the hunters hidden.

And as the Ages passed
The stories gather
Of Shadows moving through the Skies
And fear clutching all alive.

Ages passed.
We filled the skies with stories bold
Yet still the Shadows drift was cold
An anger caused by deeds unknown.

Stories grew and questions too
In wonder we learned anew
Until foreshadowed, events unfold
The Shadows tale could now be told.
But was it true the tale we claimed
Perhaps some part we choose . . .
forgotten.

We seek the Shadow now
A hunt for Blooded Moon, without fear
And Voyage far
The Unlidded Eye to snare.

But as we stand to see
Our knowledge choices drop away
And Primal Man, claims the day.
For the Shadow's rush is visceral
And thought falls, chilled as air
And Nature flees the day.

Until,
Ethereal and glorious of form
True Lidless Eye, revealed
And Stars now gather close to see
What forgotten, we chose not to be
As Primal Man darts once more
Into Shadows cool.

By *Paul Heath*
Food for the Soul,
September 2017

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The deadline for the next edition is December 13, 2017

Viewing the Eclipse From Avonport N.S.

Roy Bishop

Murphy of Murphy's Law must have been asleep on August 21, for the sky was clear over Nova Scotia that day. For the first time in the 21st century a partial solar eclipse was visible from our province. Clouds obscured the three previous partial eclipses, in 2000, 2008, and 2013.

▲ Avonport residence line up in Roy Bishop's back yard to have a glimpse of the eclipse. (*Photo: Roy Bishop*).

Even the timing of the August 21 eclipse was convenient. It began in mid-afternoon and ended just before 5 p.m., with the Sun still well up in the sky, and just in time for supper. Murphy was definitely asleep!

The August 21 solar eclipse was total along a narrow path that ran diagonally across the USA, from Oregon to South Carolina. Over the rest of North America, at maximum eclipse the Moon covered only part of the Sun, a partial solar eclipse. From Nova Scotia, about half of the Sun was hidden by the Moon at mid-eclipse, at 3:51 p.m.

▲ A young lady spots the projected image of the partially eclipsed sun on a car. (*Photo: Roy Bishop*).

I was home in Avonport that day. As advertised on the website http://www.astronomynovascotia.ca, and on the Minas Astronomy Group email list, I invited anyone interested, to view the eclipse from my backyard. And come they did, from 2:20 p.m. until 5:00 p.m. The numbers peaked near mid-eclipse with about 30 people of all ages. People were coming and going, so I estimate there were perhaps 60 visitors in total, including a couple from New York City.

I arranged three ways for people to observe the eclipse. The simplest way to view the eclipse was on the white cover of a picnic cooler I tossed on the ground under a maple tree. Sunlight shining through the many small openings between the leaves formed "pinhole" images of the eclipsed Sun on the cooler cover. A light breeze moving the maple leaves animated the images. Poets write about the dappling of sunlight under a tree, but few, if any, poets are aware that each of those dapples is an image of the Sun. At 4 p.m. on August 21 each dapple resembled a cookie with a bite taken out of it.

As a second way to see the eclipse, I set three Christmas tree ornaments covered in small mirrors (like miniature disco balls) on a stool in sunlight, and parked my white car nearby. Like the gaps between the maple leaves, the tiny mirrors projected several images of the eclipsed Sun onto the side of the car. A single, larger mirror some distance away across the lawn projected a larger solar image on the car.

Never heard of using a small mirror to view a solar eclipse? It's in the *Observer's Handbook* (p. 145 in the 2017 edition), and has been there for many years.

The third way to view the eclipse was perhaps what people were expecting: a telescope with a solar filter. A motor-driven equatorial mount held the telescope fixed in direction while Avonport tilted with the spinning Earth. Often there was a line-up to look through the telescope. Several people held their smart phone over the telescope eyepiece for a close-up photo of the eclipsed Sun.

The next partial solar eclipse visible from Nova Scotia is more than three years away, on June 10, 2021. For Nova Scotia, it is a deeper partial eclipse than the one last August. About 80% of the Sun will be hidden behind the Moon. Murphy already has

(Continued from page 4)
plans for that eclipse: it begins at sunrise, and is over by 7:30 a.m. Most people will still be asleep! Will Murphy also hide the eclipse behind clouds?

So much for partial solar eclipses in Nova Scotia. When does a ***total*** solar eclipse cross our province? The next one will be on May 1, 2079. Tell your grandchildren to mark it on their calendars. However, if you are in central New Brunswick on April 8, 2024 (less than 7 years from now!), and the sky is clear, you can experience that pinnacle of natural celestial wonders, a total solar eclipse. Mark your calendar!

The Solar Eclipse: Lingly, Wyoming

Judy Black

How far will one travel to see a solar eclipse for the first time in their life? Does 4,393 km (2,739.7 miles) - one way - sound a bit far? Having just experienced my first solar eclipse, I can unequivocally say NO!

The planning of this trip began a year ago when Paul Gray had announced at a RASC Halifax Centre meeting that he had the perfect spot to view the eclipse - from the KOA in Grand Island, Nebraska. KOA reservations made last fall - check. Plan remainder of the 2.5-week trip to and from this exciting event - check. So, let's now focus on the experience in Nebraska. I remembered Roy's cautionary note about experiencing the eclipse versus taking pictures. Consequently, I dictated notes to my phone so that my eyes didn't have to leave what I was seeing for more than a split second.

The evening before the eclipse, there was a gathering of astronomers to determine the plan of attack for the next day based on weather reports and Jay Anderson's advice. Once back at our campsite, we decided we would travel farther west from Grand Island, probably as far as Wyoming to ensure a clear sky. We left at 6:30 a.m. CST after a small breakfast, drove through dense fog across part of Nebraska before arriving at our sunny clear blue skies location on Hwy 85 north of Lingle, Wyoming at 10:30 a.m. Mountain Savings Time (MST). Interesting to note is that at one point when we turned towards Wyoming on Hwy 26, every other car (of which there were hundreds in the adjacent two lanes of traffic) was headed north on Hwy 385 to Alliance, one of the sites suggested the evening before. We were grateful we were going another way, but perhaps we went further than needed.

We drove through Lingle (population 468, elevation 1,272 m) and parked on the side of the highway next to a farmer's field on the crest of a hill. We arrived two minutes before first contact and had a phenomenal 360° view. Jerry quickly set up for his time lapse photography whereas I opened my binocular bag and witnessed first contact with filter-covered binoculars at 10:32 a.m. MST.

With the solar filters in place, the sunspots were seen. They would perfectly provide the reference points by which to observe the rate at which the moon covered the sun. Four sunspots were located in the upper-right quadrant of the sun, starting near the centre and going from lower left to upper right. A fourth was noted between the first and second but it was very weak and small and not as clearly defined. Two more sunspots were also noted at about 7 o'clock on the southwestern limb. I watched as each sunspot was hit by the limb of the Moon:

10:48 a.m. - first sunspot hit by limb of Moon second sunspot hit by the limb of the Moon probably around 10:50 to 10:52 given its proximity to the first sunspot,
10:56 a.m. - third sun spot hit by limb of Moon,
11:01 a.m. - fourth sunspot covered by limb of Moon.

At 11:05 a.m., I noticed the sun not quite as bright as it was earlier. The sky was getting just a bit darker and the colours of the landscape were subdued, not as vibrant as they were when the sun was full.

At 11:20 a.m., I offered my binoculars to the family of six next to us. Each in turn had a chance to see in a much larger view how the moon was covering the sun and to see the sunspots in the southwest limb. So much fun watching their reactions, from the parents to the 6-7 year-old. Also shared with a couple standing across the highway, and with a father and daughter who pulled beside us just a few minutes before totality.

At 11:40 a.m., the temperature noticeably cooled, enough so that a sweater was required. Also noted that we were now being serenaded by chirping crickets. It was at this point I had total interest in what was happening around me versus recording the time frame. I did not note when the lower two sunspots were covered by the Moon nor the time and length of totality. I tried to remember Roy Bishop's description of what to expect but failed to do so in the excitement of what I was seeing.

I turned my back to the sun at one point and watched as darkness quickly approached. I likened it to being a teeny-weeny little creature watching the great cape of Darth Vader billowing out as it approached and eliminated any hope of escape. I held my breath totally, enraptured as I watched it come across the field and overtake me.

What I saw next had me turning a complete 360°, and probably more than once in a couple of different directions in my attempt to decided which way I should look. A beautiful rainbow of colour appeared on the darkened horizon when the shadow overtook us. This was the one and only time I took a photo during the eclipse - a panoramic view of about 120° to 130°. Too many cars in the way to take the full 360°.

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You can see the centre of the shadow as it rapidly travels eastward.

Totality was reached! Darkness was upon us. Regulus, Jupiter and Venus were seen but I didn't think to look closer for other planets (Mars and Mercury) and stars as suggested in articles previously read. The black orb covering the sun contrasted with the elongated translucent streams of the white solar corona that reached out into the now darkened sky. I stood there transfixed and could only think, "Oh, wow! This is really cool!"

▲ Dusk at totality in Lingly, Wyoming (*Photo: Judy Black*)

Thanks to Jerry reminding me filters were not required at this point, I held the filter-free binoculars once more to my eyes to view the prominences at various locations around the moon's limb. Their fire engine red-pink colours were indescribably beautiful. I handed my binoculars to the daughter and father adjacent to us for them to see them as well. The corona wasn't perfectly circular; longer spikes at 12, 2, and almost 7 o'clock were visible. The corona was spectacular; the extent from its source was astonishing.

Once the binoculars were back in my hands and up to my eyes, Bailey's Beads appeared. Light came through the Moon's crater valleys and seemingly bent around the Moon's surface to produce a reddish glow on its surfaces, especially on the Moon's limb at 12, 1, and near 3 o'clock.

Then it happened! The "diamond"! It started as a small glimmer on the Moon's limb then shone blindingly just above the Moon's equator! Another wow. So cool! Gave me goose bumps.

According to the reference book materials, totality at our site was 2 minutes 11 seconds. It was such a short time. This wasn't long enough to truly absorb what was happening. Could a replay be granted?

It was now 11:53 a.m.. My wits are back (if they ever are) and I can once more record the events. Filtered binoculars and eclipse glasses were in use once more, and the air was still cool enough (for me) to require a jacket. The sun's light affected the colours around us, much like a spot light bleaches colours out; the dark greens of the field and nearby grasses had become a grey-green, shadows perhaps not as distinct. The crickets were still chirping.

The Moon now began to reveal the sunspots it had earlier hid from our view:

12:13 p.m. - the first sunspot. Cars were now streaming slowly on the highway behind us; they had obviously given up once the Moon had begun to reveal the Sun.

12:17 p.m. - the weaker of the four sunspots was now visible.

12:23 p.m. - the third sunspot was revealed. Cars were now bumper-to-bumper heading towards Lingle.

12:27 p.m. - the fourth sunspot was unveiled. It was also now warm enough to remove my sweater. Colours have returned to their true colour and the sound of the chirping crickets is reduced from what they were earlier during totality.

1:08 p.m. - the first of the two sunspots in the southwest quadrant were uncovered by the moon.

At 1:14 pm, the eclipse was complete. The Moon lost contact with the southwest quadrant of the Sun. Time to pack up and head back to the KOA. I now had another check mark on my Explore the Universe certificate submission!

End Note: Although it only took us five hours to arrive at Lingle from the KOA, the return trip took eleven hours. The distance between our eclipse location and the turnoff onto Interstate 80 should have taken only one hour but took five hours. Our heads hit our respective pillows at 1:15 a.m. CST, still whirring with the excitement of the day. Our trip home to Nova Scotia begins in five hours...

August Dark Sky Weekend Report

Dave Chapman (dave.chapman@ns.sympatico.ca)

The Dark Sky Weekend was held August 11 to 13 at Kejimkujik National Park, the first of two outreach weekends at Keji planned for 2017. Here are the two reports submitted by Dave Chapman, RASC Halifax's front person for these events.

As of Saturday night there were 600 Galileo Moments in all, with one night to go. Sunday night might be the best (as it often is).

The Friday afternoon meet and greet with solar viewing was the best yet, with 130 persons from 2 to 4. At 4, Paul Heath walked through the Solar System with 20 astronauts of all ages. At 9:30 the night program started (slowly) with Dave doing Ask Me Anything? The sky cleared enough for Chris Young to give his excellent laser Sky tout at 10:10. We had pretty good clear and transparent skies for about 45 minutes, while people viewed several objects through telescopes and binoculars.

Thanks to Andrea Misner, John McPhee, Karl Hudson, Paul Heath, Karl Penney, John Read, and Wayne Mansfield. All the while, Halley Davies was busy with her Sony A7 video camera and wireless mike, chronicling the event (I have seen clips and they look great!). Visitor estimate was 225.

Saturday was wet, but the gang had a drop-in at the newly reopened Merrymakedge Canteen. Only 60 persons, but it was fun. It was too wet for an outdoor theatre talk but John Read enthralled a crowd of 60 at the indoor theatre and gave away two copies of his brand-new book as door prizes: *50 Things To See in Your Small Telescope—for Kids* (now available on Amazon). Later, Keji interpreters Paul Lalonde and Lesley Rogers presented Guardians of the Galaxy at the "stone circle" to about 100 persons. It turned out to be a cloudy night story-telling event, although it cleared enough to see the stars for Muin and the Seven Bird Hunters.

▲ Some of the Friday/Saturday RASC volunteers gather together over coffee and laptops. L to R Andrea Misner, John Read, Chris Young, Paul Heath, Halley Davies and Chris Hanham *(Photo: Dave Chapman)*

By Sunday morning, the sky forecast for the following night was looking very promising, so we decided to enact the "cloud date" option: three campsites had already been arranged for the extra night. John McPhee, John Read, Karl Penney, Chris Young, and Andrea Misner headed home. We juggled things around a bit and Paul Heath, Halley Davies, and myself stayed on, Tony Schellinck joined us overnight, and Wayne Mansfield went home but came back for the evening. The evening was clear and we had dark skies from 10:20 p.m. until moonrise just before midnight.

▲ Halley Davies proudly displays her Ace Amateur Astronomer (AAA) Certificate proving she could find five or more deep sky objects using binoculars. (*Photo: Dave Chapman)*

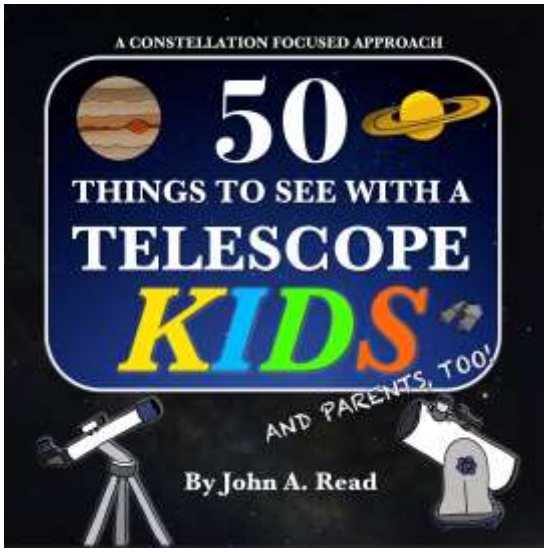
What a night! Perseid meteors galore and lots to look at in the SQM 21.7 skies. I arranged mood music over the PA and Paul gave a tour of the sky. We had two telescope stations and two binocular stations. Wayne had his 100-mm binos on the homemade parallelogram mount, and Tony set up his famous binocular table. I'm not sure what objects were observed, but I can guess they would be the obvious ones: Jupiter (before it set), Saturn, the Andromeda Galaxy, globular clusters M13 and M22, multiple stars such as Albireo and Mizar and Alcor, planetary nebulae such as the Dumbbell and the Ring, open clusters such as the Wild Duck and the Double Cluster, and so on... Halley Davies collected more video and audio, and found time to qualify as an Ace Astronomer following Tony's program.

It was a great weekend, and RASC Halifax supported a second event this year "Fall for the Stars" on September 22-24.

How to Publish a Book

John Read

I get a lot of questions about publishing, mostly by folks who say they'd like to write a book but never got around to it. Writing takes patience and diligence. Someone once told me that if you write 600 words per day, for 100 days, you'd have a novel. And it's true, mostly. 60,000 words is just shy of the length of the first Harry Potter book, or the Hobbit. It took me about seven months to complete the first draft of my first novel, *The Martian Conspiracy* (a book about a man searching for his missing family). I wrote every other day, but was able to type out an average of 1000 words every time I sat down.



Writing the first draft is an art. You sit in a quiet place, and you dream, letting unrestricted words flow from your fingers. Writing fiction is a mixture of painting and poetry in which you are the master and creator of the universe. Writing non-fiction is a data dump, collecting what you know, researching what you don't know, and then plunking it all in one place. After that, the rest of the writing process is a business.

There is something everyone who wants to write a book needs to understand. There are absolutely no barriers to entry into the publishing book world. None. Zip. Natta. **You are your own publisher. T**o clarify, if you write a book, you **have to** be your own publisher. Read on for instructions. You must establish your reputation as a prolific writer before you even think of approaching a traditional publisher or an agent.

Most people who want to write a book, or have an idea for a book, never get past step 1 (writing the book). But, let's assume you're gotten past step 1, (you're on your sixth draft and you can't possibly make it any better without help), it's time to follow this process to publish your book:

Have the book professionally edited. If you don't already have an editor, hire one at www.upwork.com (one of the best freelancer websites).

Step 2: Have the book professionally proofread by a different person (emphasis on professional). I actually have proofreading done twice, so each book has a total of at least three professional (paid) editors.

Format the document so it looks awesome and save it as a PDF. The most popular page size is 6 by 9 inches. Finalize the table of contents etc. If you don't know how to do this, hire someone.

Create a professional cover. If you're already a Photoshop expert, download the template here: https://www.createspace.com/Help/Book/Artwork.do. Save the document as a PDF at 300dpi. Make sure it looks awesome. The quality of the cover is generally a good indication of the quality of the interior.

Buy an ISBN from https://www.myidentifiers.com/. It's $125 (USD). If you can't afford it, don't worry, see step 8 (buying your own ISBN gives you more freedom to publish the book in more places).

Set up an account with www.createspace.com and set up your title (its free). If you need help here, consult a youtube video, there are several videos on this topic and all are great. If you didn't buy your ISBN from step 6, use the free ISBN from createspace.

Upload the two PDFs (cover and interior) to Createspace and follow the approval process. Once Createspace approves your title, it will appear on amazon in about a day. **Congratulations, you just published a book!**

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In Kindle Direct Publishing, select "KDP Select" for your book. This enables you to offer your ebook for free, five times every 90 days. Set up the five free book promotions. This is a good way to get your book out there. Advertise your free book promotion on Twitter and Facebook (in my case, lots of people see my free ebooks, and then purchase the paperback).

Set up an author page on https://authorcentral.amazon.com. From here, you can control the content that shows up on your book's Amazon page. Make sure the author biography is correct (Amazon occasionally assigns my books to the wrong John Read. You want to catch and fix these issues ASAP).

If you're happy with your paperback, invest in the creation of a hardcover edition of the book. You can do this here: http://www.ingramspark.com/. You'll need to purchase a separate ISBN for the hardcover edition of your book. You'll also need to create a separate cover. You can get the template from the "Help" section on IngramSpark's website. The final setup of the hardcover edition will cost $50. **Congratulations, you now have a hardcover book!** This will appear beside your ebook and paperback on Amazon in a few days.

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If your book is a novel, or text based non-fiction, you'll want to create a professionally edited Audiobook, voiced by a professional voice actor. This is EASY (probably because voice actors are always looking for work). There is an Amazon owned website called ACX (https://www.acx.com/). This website connects authors with voice actors. To create your audiobook, create an account, and list your book. You can then invite voice actors to audition to read your manuscript. Once you've chosen your voice actor, and they have agreed to read your book, you select one of two types of contracts. The first option is royalty sharing, where you share 50% of the audiobook royalties with the actor. Otherwise, you simply pay the actor for every hour of recording. Then, you follow the process (which I won't go into, but it's really easy) of working with the actor to produce the audiobook.

After the book has been recorded and edited (by the actor), the book will appear on Audible.com and Amazon.com within a few days. **Congratulations, you now have an audiobook!**

Now that you have **four** products created, it's time to spread the word about your book. Around five million books are published each year, and only the top few thousand ever get read by more than a dozen people. If you want people to read your book, you need to market it. Consider purchasing ads on Amazon (these seem to be the most effective) as well as on several social media platforms. If your book isn't selling well online, don't worry, this is completely normal. There are eight million books on Amazon, and only the top few thousand books actually sell.

Good luck!

My impressions on the Partial Solar Eclipse of August 21 from Dalhousie University.

Michael Boschat

It was an interesting day. I was going to try some experiments but when people began showing up all that was not feasible. I had at least 20-30 people lined up to look though my properly filtered ETX-90 and I was amazed that the clock drive -

▲People observe the eclipse on the steps of the Dunn Building on the Dalhousie campus (*Photo Michael Boschat)*

which runs on three AA batteries lasted from 1pm until 5pm. I had the ETX-90 on it equatorial position - it has legs similar to the Questar, and I had to eyeball roughly where north was so it would track the Sun - which it did very well.

Most of the people I had varied in age from young to seniors and the biggest thing was all trying to get images with their phones. That was a challenge! Many enjoyed the view as the Moon slowly covered the solar disk.

Many of the people noted sunspots and asked questions about how an eclipse occurs and what were sunspots.

At mid-eclipse, there was some thin cirrus clouds and I noted a slight temperature drop, also the area looked a light orange colour... I thought it was just me until a woman beside me asked if I noted a rosy type colour! I assume it was probably because of the Sun in that thin cirrus.

In all it was interesting, an estimate I heard was about 350 people and 1 dog! In all it was a good day, tad humid.. but worth it...

I attach only a couple images, I had a hard time trying to get any with my camera or phone as I was helping others to get some and only managed at a very short break to get any. These were all I could get of the eclipse and some of the people.

Clear skies

▲The Moon bites into the Sun (*Photo Michael Boschat)*

Centre Meeting Notes 15 September 2017

Chris Young

Paul Gray opened the fall meeting of the Halifax Centre by welcoming the 44 members and guests and introducing the Board of Directors of the Centre. Paul noted we will be nominating new (& old) members for the Board. If anyone has any interest, or is curious, please contact any of the Board. Paul Heath gave a brief report on the eclipse outreach event at the Discovery Centre. He and member Wayne Harasimovitch and a small group of volunteers shared views of the eclipse with over 500 outside and 970 inside the Discovery Centre. Other eclipse events occurred at Dalhousie, St Mary's and many street corners where Centre eclipse glasses were shared with passers-by. In January, Paul will start working with other cultural groups on outreach activities.

Paul Gray advised of a new Centre Meeting time starting with the November 17th meeting: at 7:00 PM Blair will provide a talk until 7:45 on astrophotography and at 8:00 the main meeting will begin. Our December meeting will be the AGM.

Judy Black provided a recap of this summer's Nova East which was a success with some observing, excellent lectures, food and socializing.

Dave Chapman showed the premiere of the Centre's YouTube video on "How to Use a Star Finder" which stars Andrea Misner, a former Halifax Centre President and current member in Winnipeg. Halley Davies (of Ode to Hubble fame) shot the footage and edited the video and Dave Chapman organized and participated in everything – well done! Have a look on the Halifax RASC Centre's YouTube site. Halley's next project with us is to edit the footage taken at Keji Dark-Sky weekend – stand by for this!

Next came a series of presentations by Centre members who traveled to the path of totality, collecting at the KOA Campground in Nebraska, before dashing off to clearer skies 30 minutes before the eclipse commenced. All the presentations had images and videos of members' experiences. Notables Terry Dickenson and Alan Dyer were also at the KOA and shared their experience with our members.

▲ Dave Lane shows a satellite image of the cloud cover during the eclipse. (*Photo: Chris Young)*

Judy and Jerry Black presented their "Road to Darkness" travelogue of their eclipse journey. They did a "he said, she said" dialogue of their shared, but individually experienced, eclipse experience—Judy with filtered binoculars and eclipse glasses and Jerry with his cameras, laptop, GPS, software and a rush job.

Dave Lane gave scale to the number of people who experienced the eclipse – noting cars parked on both sides of the road for 30 miles. He gave a satellite view of the weather and cloud patterns.

This was Dave Chapman's third eclipse and he recorded the eclipse observers capturing their conversations and excitement. Dave had travelled down with Tim Doucette.

▲ Paul Gray describes the site where his family watched the eclipse. (*Photo: Chris Young*)

Martin Hellmich and Halley Davies were in Oregon and drove away from the forest fires to get to clear skies on someone's front yard along with their neighbours. It took two days to get out of Oregon with the stop and go traffic.

Paul Gray made a family trip of this event and shared stories and images at stops along the way including the Field of Dreams surrounded by corn fields. They ended up watching the eclipse, and sharing their viewing equipment, on

▲ Alan Dyer's set-up for viewing the eclipse.

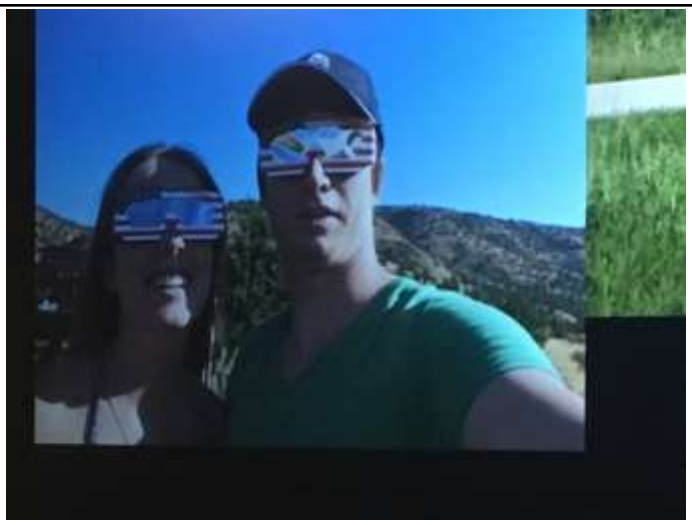
(Continued from page 10)

a gravel road in the middle of nowhere with people from Illinois, Missouri and four guys from South Dakota in a pickup truck. For the first time Paul witnessed the shadow bands of the eclipse (see Wikipedia!).

All the presenters expressed pleasure in sharing the experience on the side of the road and in farmer's fields, with travelers from many states. They all reported they felt a special bond with these random individuals who witnessed the totality together.

The eclipse presentations ended with a video by Alan Dyer of the eclipse – have a look at Alan's "Totality Over the Tetons" on Vimeo.

Sean Dzafovic wrapped up the presentations of the evening with his What's Up in the upcoming nights. The evening ended with refreshments, conversation and sharing of stories. It was an enjoyable meeting.



Halley Davies and Martin Hellmich are geared up to watch the solar eclipse (*Photo:* Martin Hellmich)

Starlight and Semiconductors: Creating Colour in Your Astroimages

Art Cole

Quite often when people look at objects in my astroimages they ask me the question, "Are these its actual colours?" They're often surprised, and become argumentative when I tell them that no one really knows what colour they are.

The first thing to know when trying to understand night-time colour is that humans are exceedingly poor at seeing it. Poorly-lit or dim objects appear grey to us, no doubt due to some evolutionary trade-off that gave us colour vision in the daytime, while helping us to avoid lions at night. Aside from bright stars, the planets, and some of the brighter planetary nebulae, astronomical objects look grey through a telescope. Another important thing to know about colour is that it's purely subjective – colours do not exist in nature – they exist only in our heads. What we perceive as colour is no more than a smorgasbord of multiple wavelengths of light entering our eyes and being processed by our brains. An apple mostly reflects longer wavelengths of light, making it look reddish, and a blueberry reflects shorter, bluish wavelength. But no on knows how other people see colours – we only know what we see personally.

But suppose you wanted to be as accurate as possible. The closest approximation to what we see through the eyepiece (at least for deep-sky objects) would be to remove all colour from the image, except for the brighter stars. But that wouldn't be very interesting to look at, and our cameras do produce data that indicate what wavelengths of light are being collected. It would be a shame to throw that all away for the sake of accuracy.

What, then, is the next best thing? It would be to maintain the colour data collected by your camera in your subframes, attempting to keep the colours the same all the way through to your completed image. The problem with this, however, is that it's virtually impossible to complete the usual processing steps leading to a final image (such as stacking, stretching, noise removal, etc.) without changing the original colour.

In the end, my advice is to not pursue "true" colour in astrophotos. For most astroimagers, producing pretty pictures is the goal, and a big part of this is creating vibrant colours that people enjoy looking at. So, process those images as you see fit, and crank up that colour saturation!

▲ Two images of the same objects (the Lagoon and Trifid Nebulae). The one on the left was made using the Hubble colour palette, and the one on the right was made with the "Cole" colour palette. Which one has true colour? Neither! (*Photo: Art Cole*)

Nova East - a Stellar Event!

Judy Black and Melody Hamilton

This year was a significant year for the Halifax Centre. For one, the Centre celebrated Canada's 150th Anniversary and was one of the many Centres across Canada that participated in a national star party or event. “Nova East - Canada 150 - National Star Party” was the theme of our star party held at Smileys Provincial Park during the week-end of July 28-30. Secondly, this was the 30th consecutive year for Nova East making it the longest consecutively held star party in the Atlantic region. The agenda had something for everyone.

And what better emblem for a Nova East / Canada 150 Star Party than a red maple leaf-shaped photo of the Orion Nebula on a blue star-filled backdrop from the Hubble telescope! Many thanks to John Read for the out of this world design for 2017 Nova East.

Speakers:

Two school bells were rung to ensure members did not miss the beginning of each presentation and event. Thank you, Melody and Liz Greenough, for your bell ringing expertise.

Keynote Speaker: Natural Satellites of Jupiter - Pat Kelly provided the history and science of Jupiter's moons, including their geological histories. He amazed all in attendance by explaining the astronomical number of small moons circulating around the planet, in addition to the "Big 4". He then talked about the observable phenomena involving the brightest four, including an explanation as to why triple shadow transit events are so rare, and why an orbital resonance makes a quadruple shadow transit event impossible. He also looked at the interplay of events involving the moons transiting and casting shadows on each other, which happens every six years when Jupiter is at its equinoxes. The presentation whet everyone's appetite to observe Jupiter later in the evening.

Observing the Night Sky with a Telescope - Kathy Walker presented questions commonly asked by beginners and questions beginners should ask. She addressed what a telescope does, magnification, how to choose a telescope and set it up, what to expect when you look into the eyepiece, and what to look at. She also included accessories needed in the observation session, such as a chair, red flashlight, and eyepieces. She was thanked by newcomers to astronomy for answering the basic questions they also had.

Wide Field Night Sky Photography - Dave Chapman addressed camera types, their benefits and limitations, and required accessories for nightscape photography. The key is to get lots of photos to the lens via fast lens or to extend the exposure time. He also stressed the need for a good tripod, one that would not move if hit accidentally. Although he did not explain specifically how to take the picture, he detailed what was required to acquire it. He left the audience with the following thought: "Nightscape photos provide perspective and allow the viewer to step into the view."

From Trekkie to Teacher - My Celestial Journey - Andrea Misner described her journey from when her interest in astronomy began as a 14-year-old through to her completion of a physics and teaching degree to her move to Winnipeg where she teaches and involves her students in the Global Space Balloon Challenge. She showed how the students designed and built all components: the balloon basket that had to carry payload (i.e., camera), the balloon, and parachute. She also required an amateur radio license. They initially used the APRS tracking system but they wanted more than tracking so the students built an Arduino tracking system. The project started in September and launched in late April. The result? Their balloon travelled 30,000 metres in 2 hours and landed in the USA. Initially there was one school involved but now there are 10! Kudos to Andrea!

Amateur Radio Astronomy - Matt Paine, our member from Massachusetts, has been an amateur radio astronomer for 5 years, and was very enthusiastic to share his love of this medium for exploring the universe. He happened across the Greenbank radio scope with multi-speed frequencies that inspired him to combine radio training with his interest in astronomy. He studies the universe using a variety of radio frequencies with fixed and movable antennae and dishes. He explained the benefits of radio versus optical astronomy:

a- radio frequencies pass through clouds, dust and all types of weather
b- can be used day or night
c- can look into the heart of nebula and galactic gas clouds

Observing the Night Sky with Binoculars - Tony Schellinck reinforced the value of binocular observation, especially for recruiting observers. He discussed the barriers to observing, the reasons to start binocular observing, and the benefits compared to telescope observing, and explained how to collimate binoculars. He encouraged binocular viewing as a way to excite people about observing because it is so simple and relatively inexpensive. To encourage binocular observation, he provided five solutions:

1- Binocular Table at events such as this where easy-to-find objects are shown to observers,
2- Ace Amateur Astronomer program for new observers he developed,
3- Flat screen planetarium shows where the audience can practice with binoculars,
4- Beginner book for observing with binoculars, and
5- Binocular Observatory, i.e., a clear area near town where a group of people can set down their chairs and observe the sky together using binoculars

Field Speakers:

Our two field speakers were busy out in the open field - Paul Heath and Tony Schellinck. Because of the cloud cover on Saturday night, their presentations were limited to Friday evening. Because there was some cloud cover, Paul set up his telescope for members and the public to view the moon Saturn and Jupiter with its moons. He then gave his energetic sky tour through the slowly clearing skies. Afterwards he sent the folks over to the binocular table where approximately a dozen people took up binoculars.

Tony immediately engaged his audience and had them finding the double-double in Lyra, Mizar and Alcor, the Coathanger, and Albireo in Cygnus. When the skies cleared even more, he instructed them on how to find several open clusters such as the Butterfly Cluster (M6), the open cluster M7, the Lagoon Nebula (M8), the Swan Nebula (M17) and finally the Andromeda Galaxy (M31) which appeared last. Six people had their Ace Amateur Astronomer Certificates signed before the evening was concluded.

▲ The Nova East field at Smiley's Park as Paul Heath gives his Sky Tour (*Photo: Jerry Black*)

Other Highlights:

The ***Astronomer's Breakfast*** was once again organized by Chris Young. The Saturday morning pancake and sausage breakfast came with coffee, muffins, and fresh whole fruit. Thank you to the three cooks - Chris, Paul Gray and Bruce Hamilton. Sunday's fare was a little lighter with coffee, muffins, donuts and fresh fruit.

The ***Potluck BBQ,*** organized by Paul Gray, was another gastronomical success. Registrants were treated to a wonderfully barbecued beef roast and Italian sausage, accompanied by numerous salads and side dishes provided by attendees. And who could forget the phenomenal dessert table! Thank you to all who contributed.

The ***Astrophotography Contest*** was adjudicated by Blair MacDonald, Mary-Lou Whitehorne and Allen Sutherland of Atlantic Photo Supply. Submissions were judged in several categories such as astronomical interest, technical merit, originality, and artistic value. The prize - a large framed photo of the winning image - was presented by Mary Lou to Jerry Black for his entry of the Milky Way at Turret Arch in Arches National Park, Utah.

Chris Young and John Read acquired numerous door prizes that delighted all of the lucky winners, such as flashlights, card decks, star atlases, moon atlases, toques, hex tools, and logbooks for RASC Explore the Moon and Explore the Universe programs. John also donated copies of his two "50 Targets" books as prizes. Allen Sutherland of Atlantic Photo Supply again generously donated the "Grand Prize" of a 130-mm Newtonian Telescope.

Special recognition was made of those RASC Halifax Centre members that were presented with RASC certificates and awards since the previous Nova East. A special recognition was given to Paul Heath for receipt of the RASC Qilak Award presented to him in Ottawa at July 2017 General Assembly. Observation certificates were also presented by Paul Gray to:

Astro-Imaging Certificate
- Tony Schellinck (Deep Sky)
- Michael Gatto, in absentia (Wide Field)
- Jeff Donaldson, in absentia (Deep Sky)

Explore the Moon
- Paul Evans

For the final presentation, Dr. Roy Bishop provided a few words about Melody Hamilton and her observation achievements before presenting her with her fifth Society observing award: Deep Sky Gems.

As stated earlier, Saturday evening skies were clouded over but the Co-Chairs had a contingency plan. Melody gave a presentation entitled *Name that Astronomer* in which pictures of noted astronomers were shown and members had to guess who they were. The surprise element came when photos of Halifax Centre members appeared - not all of them were easily guessed.

We would like to thank Liz Greenough for her assistance at the registration desk and for being an excellent bell ringer. We would be remiss if we did not acknowledge our fellow 2017 Nova East Planning Committee members - Chris Young, Dave Chapman, John Read, Paul Gray, Irene Moore, Jim Millar, and Dr. Roy Bishop (consultant). The success of 2017 Nova East was because of the dedication, imagination and prep work done by all members of this incredible team. Many thanks!

My Keji "Fall for the Stars" Weekend

Gillian Webster

RASC Halifax partnered with Parks Canada at Kejimkujik National Park and National Historic Site for a second dark-sky weekend event this year, held on the first weekend of autumn, September 22–24, 2017. Keji (our nickname for the park) has been one of several RASC Dark-Sky Preserves since 2010 and there has been at least one RASC-PC partnered event every summer since.

One of 25 paying visitors, I signed up for a $15.00 special night hike to Peter Point on the Friday evening. The entire event took 3 hours, in which RASC volunteers Dave Chapman, Judy Black, Jerry Black and Melody Hamilton joined up with Keji interpreters Ashley Moffat and Lesley Rogers to offer a guided walk from the Eel Weir road to Peter Point, starting at 6:30 p.m. Staff from Boxing Rock Brewery came along to bring snacks and Dark as Keji beer! It was amazing to see the Sun (and its reflection) sink over a lake, all of us basking under clear skies, and at a balmy 20º C. This dramatic scene marked the fall equinox in Keji for 2017, and the entire event was just as great.

After we watched the Sun set, we stayed around to watch a 7º waxing crescent moon sliding into view, just to the west of the now vacated spot where the Sun had been. Ashley pulled out a travel guitar and sang a song about the night hawk. Melody urged me to take out my 7x50 binoculars and I was glad I did, as through them the crescent changed from a flat image into a 3D one. We put away our new Boxing Rock tumblers and took turns lighting our lanterns, and walked a little way along in the dark. Ashley sang us another song–this time about an owl. It was very melodic and yet didn't attract the barred owls, the "stars" of the song. Then we picked our way by lantern light to Peter Point.

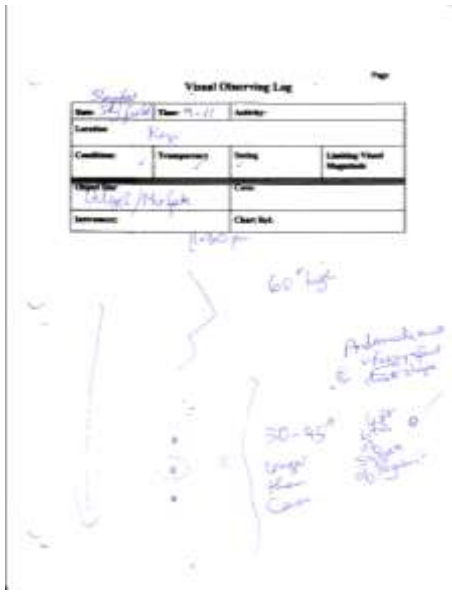
We waited there on the small beach for what seemed like ten minutes staring at an empty, clear sky. Slowly, it seemed like the stars began their show, the brightest ones starting up the orchestra. One minute we were training our naked eyes (many of us had binoculars) on Saturn and then, adjusted, we were able to appreciate the DAVe stars (Deneb, Altair and Vega, that is, aka the Summer Triangle). Before long, most of us were lying on our backs on the cool sand, admiring the Milky Way. Our quiet experts gave us a guide to the Summer Triangle and more: reddish Antares, seen at the previous spot low in the south was joined now by Arcturus in the west. Boxing Rock staff went round and refilled tumblers and handed out dessert snacks. Delicious, I ate the chocolate peanut butter balls first. I found out from the empty baggie the next day that they used spelt flour, not that it was it would have put me off, just a bit of a surprise. I'd heard of spelt pancakes and eaten them, but more as a penance than as a pleasure. Since I had raced down from Halifax, leaving at 3 p.m., I had only eaten a small supper of garden tomatoes (overflowing in my yard.)

By 9 p.m., Melody and Judy pointed out Capricorn to me as it rose over and along the tops of trees at the tip of Peter Point. Judy said something about the shape reminding her of Orion's Underpants, and once I compared the shape I saw to my star chart, I could see what she meant. I couldn't see a goat, but perhaps next time.

Next, the group turned around 180 degrees and literally stepped over the path to watch the Big Dipper and Corona Borealis setting over Keji Lake on the other side. I took up a position on the reed bed—a little soft, but I got a few square feet to myself! One of the park interpreters told us a Mi'kmaq legend, called Muin and the Seven Bird Hunters. It is a traditional sky story that features the movement of these stars around Tatapn, the North Pole. The bird hunters include the Robin, the Chickadee, the Grey Jay, the Passenger Pigeon, the Blue Jay, the Barred Owl, and the Saw-Whet Owl. The seven birds are formed from the stars of the Big Dipper and Bootes. Corona Borealis is the den of the Black Bear, Muin, from which she emerges each spring. It's a story that unfolds in the northern sky two hours before dawn during the four seasons that has a multi-layered, perennial significance involving birth, death and renewal. For more of the legend, see http://www.integrativescience.ca/uploads/articles/2010-CAPJournal-Mikmaq-Night-Sky-Stories-Harris-Bartlett-Marshall-aboriginal-astronomy-science.pdf.

▲▼►Gillians Sketches of Perseus and Surrounding Stars

After a while, it was time to turn around and head back to our cars, in the parking lot by the gravel road. By 9:30 we said our goodbyes and some of us drove back to the Jeremy's Bay campground and the Sky Circle. I elected to return to my tent to tidy up a bit. When I picked up my new LED lantern to walk over to the Sky Circle, I realized I didn't have my bearings. In the end, I'm glad I chose to go to sleep instead of wandering around, since the next evening I got lost returning from the nearby



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washrooms. (Luckily, Dave and Chris reacted well when I shone my beam their way and steered me back "home.") It turned out that the fog rolled in quickly around 10:00 p.m., so I didn't miss a lot.

The next morning I stopped along the road on the way to the Visitor Centre, when I saw a group of people crowded round one of the turtle pens. We all peered through the mesh grate, but learned we'd missed the baby snapping turtle hatching by a day (26 of them!). Before long, though, a small movement in the den showed us the baby finger length head and neck of another tiny snapping turtle. S/he was trying to climb over an egg, getting leverage to push up and over the rim of the "nest." Unfortunately the turtle decided not to emerge so we didn't get to see it run a hundred feet over to the (Mersey) river, employing its senses to find water. The Keji turtle release team members I talked with said their main concern is for the endangered Blanding's turtle, but showed a huge enthusiasm for helping other turtle species. The annual cycle of spring nesting and late summer hatching (90–120 days) reminded me of the Muin seasonal story.

A couple of telescopes were set up by John McPhee and Jerry Black at the Visitor Centre parking lot. We compared sunspots. The RASC "drop-in" group there spent several hours with interested park visitors, explaining the weekend's events and handing out freebies.

By 7:00 p.m. the visitor centre auditorium was packed, ready to hear Pat Kelly make his presentation on the four moons of Jupiter. I learned a lot: for example, one moon is bright yellow from the sulphurous volcanic activities that erupt all over its entire surface. Door prizes followed the talk and I won a copy of John A. Read's "50 Things to See with a Small Telescope." Dave expressed appreciation from RASC Halifax Centre to Atlantic Photo Supply and author John Read for providing door prizes.

By 8 p.m., I was on my way over to the Sky Circle at P1 in the Jeremy's Bay Campground again. RASC volunteers had people fixing their gazes on the ET Cluster for one and the Andromeda Galaxy for another. Again, a warm evening, along with lots of people using their red headlamps like me.

I got to view the constellation of Capricorn the Sea-Goat again. That's one for my further study soon. It was really beautiful, stars strung out like fairy laundry on a celestial washing line.

By midnight, despite moving around a bit, I was getting tired and headed back to the campground with Judy Black. By then, I was kind of overwhelmed by everything I'd seen (and not seen!) Jerry and Judy Black with their friends Daphne and Peter had a campfire back at their site so that was a lovely end to a full day.

I made some rough field drawings the next morning before breakfast. There's nothing like the lure of breakfast to move me along. So my log sheets have some relative drawings of Perseus below Cassiopeia. The evening's best for me had been Perseus: Mirfak, with its bevy of smaller stars surrounding it, and Algol off to one side. I knew the constellation's basic "shape" but I'd never seen the elegant dazzling figure that I now saw so close up as in my 7x50 binoculars that night. The way Perseus appeared to me was like a waterfall jetting downwards, tumbling over rocks. There just seemed so much movement going on! There's nothing like seeing a mythical hero come to life. Everyone wants to draw in their breath at seeing something magical and that's one of the things I like about the Society–members all seem to enjoy every minute of it.

The 360º view meant I could star-hop from Cassiopeia to Andromeda to Pegasus. Judy introduced me to detailed star maps that I could scan with my red headlamp. I always get a thrill from Draco's head. It took me forever to find the dragon between the two Dippers and now, on a clear night, I always look for it. In vain, I searched for M13 in Hercules' side with my 7x50s. My friends were very helpful but I felt my eyes straining and finally left off looking. I read later that Hercules is considered a large constellation, but that since some of the stars are quite faint, its not easy to see head, neck, shoulders, torso (the Keystone) and legs–let alone that important club to hit Draco with!

Anyway, I've been advised by Dave that M13 is half way between Vega and Arcturus. I've lots to learn first that I need to do automatically, such as locating my object and bringing my binoculars up. (When I returned home the next day, I realized I had a big smudge on my left binocular lens.) I can see I need to learn how to cope with regular obstacles to viewing–I have some kind of middle-aged eyespots, they look like sunspots, and I have a prominent one in each eye. Next time I'll prop my glasses on my forehead and bring my tripod, since I'd like to start sketching.

To add to the sky show, I got a lovely view of the sparkling bowl of Pleaides and its handle, circling above the horizon by 11 p.m. I hadn't realized how big, bright and close-knit the stars of the "Seven Sisters" were. Before now, in comparison to my old acquaintances, they looked brighter, but I hadn't realized so many of the Sisters were so bright—and I did see more than my usual six or seven in the city.

I was having some trouble locating star constellations and part of it was that they all kept moving anti-clockwise; some seemed to grow dimmer just as I was getting comfortable with them, for example, Sagittarius at 8:00 p.m. looked more robust to me than at midnight. Maybe it was just me. I did enjoy watching the Big Dipper's flat bowl tilting backward over the hours.

I found there were a few constellations I wanted to see but could not. I could not find one of Judy's favourites, Sagitta, near Albireo, but I never have a problem finding Delphinus, which is also nearby. On the other hand, I kept accidentally finding the Coathanger, first on Friday night and by late on Saturday night, I knew where to look for it. It's spectacular, of course. I can't

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help but think of having a matching diamond brooch to pin on my fall jacket!

While all this was going on, a lot was happening with park staff guiding events in the large field next door (to the Sky Circle). I caught a little of what was going on: there was cosmic music, a laser night sky tour, and sky stories. I heard thundering music from 2001: A Space Odyssey. When so many people take the time to wrap themselves up, walk around in the dark, listen and look up, there's a good deal of excitement and those sharing their sky knowledge were very pleased. There was a lot of advertising and a lot of preparation that went into this fall edition of a Dark-Sky Weekend and RASC members and Keji staff worked very hard to prepare interesting programs and good experiences. (If there was one more experience I would suggest, it would be to set up netted trampolines for folks to observe in–I've done it a couple of times and its an exciting way to help people (especially for those who have summer cottages) orient themselves to the stars at a particular hour at different compass points).

My last incredible contact with the Universe happened like this: Judy and I were called over to view the Eastern Veil through the biggest telescope I've ever seen, owned by Mark Dryden. Its fun to climb a ladder in the dark, but mysterious beyond words to see a floating, billowy sliver of a curtain hanging in a large C shape somewhere beyond our Solar System. We climbed down, (I was feeling baffled–what had I seen?), and turned to leave, when we were summoned back to see the Western Veil! Mark kindly showed us the whole shape of the Veils on his computer screen and that was helpful. At least, this strange thing was marked on a map and had substance. Then the climb up again…this time a star shone through another veil that flowed in a vaguely crescent shape–an upside down arc, like an upside down letter C. Sometimes things can only be described by opposites. The two veils looked like the opposites of rents in the sky. They reminded me of the Milky Way, but perhaps one that could be a billion times further away. The Western Veil was even more beautiful and awesome than the first – and with the star shining brightly in the background, it really looked like a royal bridal veil!

Sharing this deep space weekend with others was incredible. I had a brilliant time! Thank you to all who organized and participated in it!

A Report on the Fall for the Stars Keji DSW

Dave Chapman

▲ Two excited children receive a copy of John Read's 50 *Things to See with a Telescope for Kids.*

Despite the gloomy forecast, Friday night's programs proceeded with enough clear sky to satisfy everyone. The night hike to Peter Point was sold out, and I had the pleasure of going along and co-hosting with Keji staff and RASC volunteers. The Sky Circle had a smaller than usual crowd, but they were enthusiastic about the laser sky tour and viewing through telescopes.

Saturday, the Sun cooperated with solar observing, and we had a good crowd, plus dozens of people visiting our info table.

The second and last night of Keji "Fall for the Stars" was a great success. Pat Kelly presented his talk "The Moons of Jupiter" to a standing-room-only crowd followed by a lively question period and the door prize draw.

Many thanks to Atlantic Photo Supply and John Read for donating prizes

The Sky Circle field was a busy place, with multiple activities taking place at the same time: Guardians of the Galaxy (Keji program), binocular table, monster telescope, Keji telescope, giant binoculars on a mount, and several other RASC telescopes. Activities started by 8 and we still had visitors until 11. The sky was clear, with an SQM reading of 21.6 at its best (i.e., pretty dark but not as dark as it can be).

Overall, with some minor deficiencies, it was as perfect a Dark-Sky Weekend as you can get. I estimate 475 visitor experiences over the weekend (the campground was well occupied but not completely full).

Thanks to Tony Schellinck, Chris Young, Mark Dryden, Greg Croft, Pat Kelly, Paul Gray, Jerry and Judy Black, Karl Penney, John McPhee, Gillian Webster, Wayne Mansfield, Melody Hamilton, Bruce Hamilton, and Jim Millar.