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Summer 2019

HORIZON

LA SOCIÉTÉ ROYALE D'ASTRONOMIE DU CANADA
New Brunswick Centre du Nouveau-Brunswick
THE ROYAL ASTRONOMICAL SOCIETY OF CANADA

Whirlpool Galaxy Crescent Nebula

Images by Emile Cormier

Left: M51 Whirlpool Galaxy and NGC 5195 captured in May 2019. 8" Richey-Chretien on CEM60 mount with ASI1600MM-Cool camera. ~3hrs total exposure in good seeing.
Right: NGC6888 Crescent Nebula in Ha/OIII/SII, captured in August 2017, processed in July 2019. 6" Maksutov-Newtonian on EQ6 mount with ASI1600MM-Cool camera. ~3hrs total exposure.

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NB Astronomy Clubs
Réunion / Meetings

SRAC/RASC Centre du NB Centre

Sept 21, UNB Fredericton
Oct 19, Annual Meeting at MHS
Nov 16, Saint John Rockwood Park
http://www.nb.rasc.ca/

William Brydone Jack Astronomy Club (Fredericton)
When: Second Tuesday of the month
Where: Fredericton, UNB Campus
2 Bailey Drive, Room 203
www.fredericton astronomy.ca

Saint John Astronomy Club
When: First Saturday of the month
Where: Rockwood Park Interpretation Centre.
www.sjastronomy.ca

Astronomy - Astronomie Moncton

When: First Quarter Moon weekend observing
Where: Moncton HS Observatory
www.astronomymoncton.org

Find us on ...

FACEBOOK
https://www.facebook.com/RASC.NB

TWITTER
https://twitter.com/rascnb

Star Parties / Events 2019

Kouchibouguac Fall Festival
September 27 - 28

Exploring the Moon with Binoculars Course
Rockwood Park, Saint John
September 25 - October 30

Irving Nature Park Oct 4

Fall Astronomy Day and International Observe the Moon Night: October 5

Mercury Transit: November 11

Archeoastronomy: It's really a thing!

by Mary King

I was part of an archeological dig related to Classic Maya culture in Blue Creek, Belize (July, 2019), run by the University of Texas at Tyler. The Maya culture continues to fascinate our modern world with its pyramids, art, writing, calendars and astronomical observations.

Astronomical observations of the sky from the tops of Maya buildings appear to be especially important, given that the rainforest canopy does not provide many recognizable features in the landscape, neither then nor now. Therefore, it is believed buildings were built according to the position of the Sun on the horizon at the solstices, equinoxes and zenith passages. This allowed rituals to be performed that were synchronized to heavenly events, which helped consolidate the power of the Maya elite.

Altun Ha, located near Belize City, is a popular stop for tourists on cruise ships. It was here that Canadian archeologist Dr. David Pendergast in 1979 discovered a carved jade head of Kinich Ahau, the sun god, weighing 4.4 kilograms. At Laminai, a site further inland, stucco masks still flank the stone temple, all of which would have been painted in bright colours to further impress the splendour and power of the elite upon the people.

Laminai -- stucco mask on temple face, once brightly painted. That's Mary's nephew Mark on the right.
Mary King Photo

Astronomical observation sites were believed to have been performed at architectural groupings referred to as E-groups. Odd name, I thought, but the nomenclature comes from the first group of buildings to be discovered with this feature at Uaxactun in Guatemala, near Tikal.

The Sun and Moon were observed by the ancient Maya, especially the eclipses. The Dresden Codex, one of four codices of Maya culture extant, records seven pages of eclipse tables, with recordings of eclipses over 46 of their 'ritual count' years (a Tzolkin year had 260 days), including 11,960 days. The Maya associated Venus with warfare, as depicted by war images and Venus in the morning or evening sky. Battles may have been planned to coincide with movements of Venus. For example, the city of Dos Pilas attacked Seibal on December 3, 735 AD, when Venus was first discernable as the evening star. It is enough to make you want to rethink sending Valentine Day cards, doesn't it?

The decline of classic Maya culture is dated after 909 AD, after the last recorded long count date, with only some pockets of Maya civilization still surviving. Chitzen Itza was abandoned after 1200 AD; this was well before the first contact of the Spanish in 1525. What led to the decline is still a mystery, although ecological decline is a major possibility.

I blush to say it, but I didn't make the effort to do any serious viewing while on the dig. What with being 62 and

Foundation of E group buildings at Altun Ha
Mary King Photo

digging in trenches, lugging buckets of dirt and then sifting them in 93 degree heat and 95% humidity all day made me fall into my bunk by 8 pm on most nights. But, being on a Maya site and uncovering Maya artifacts, be they everyday or ritual in context, encourages me to see the sky as the Maya might have seen it: predictable yet mysterious , mundane yet magnificent.

(Some of the leading archeoastronomers to study and publish about this topic are Anthony Aveni , Colgate University at Hamilton, NY, and David Freidel , Harvard University.)

When in Houston... Tour NASA!

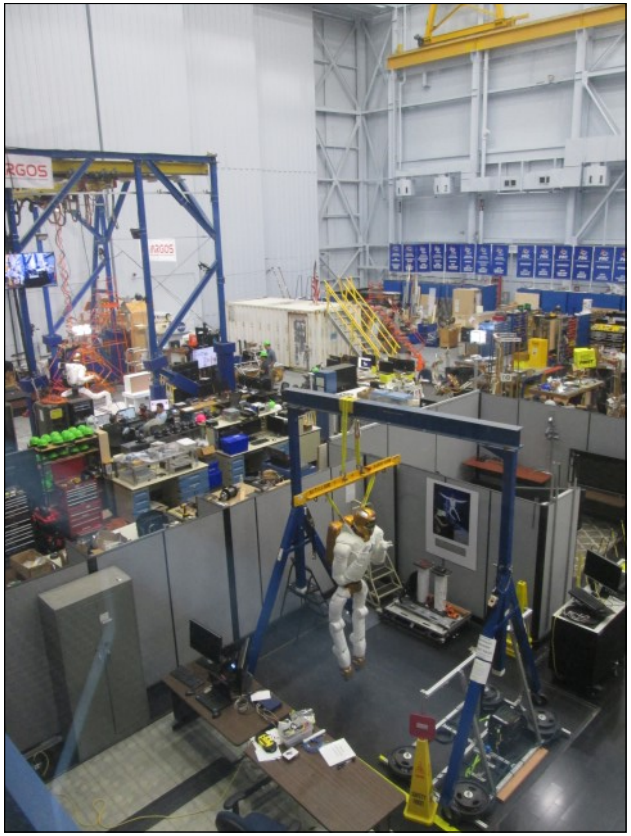
by Mary King

Overnighting in Houston (on my way to Belize) meant overnighting for two nights to allow for a tour of the city and a tour of NASA. The entire NASA facility is a must-see, and these brief notes do not do it justice. The Rocket Part houses the Saturn V rocket with the Apollo 18 capsule that never flew. If you want to feel small and don't feel like dieting, stand beside this behemoth. Cutest kid question of the tour: "How did they get the rocket in the hangar?" Answer: They didn't. They put the rocket in place and built the hangar around it!

Next mission: the Moon and Mars. Paramount to human exploration will be the use of robots, and the Orion Mars mission is crafting robots that can work in high radiation environments, hence the gold plating on the mannequin. The White Flight Control Room is a training room for NASA engineers as they learn to deal with real life (read 'real problem') issues on the ISS. The career plan is that you have to work ten years at NASA before you work in the simulation room, and five years in the simulation room before you move on to the real thing. I think my resume will go directly to the circular file. No mention of the Space Shuttle Program would be complete without noting the Canadarm, retired in 2011. A touching moment came when the tramway tour asked for silence as we passed a small grove of trees that commemorate the astronauts and Centre directors.

Some interesting, random facts: NASA is listed as part of the city of Houston, even though it is miles away. There is no hunting permitted on site, and deer come to give birth there. There are long-horn cattle on the site as part of a contest that awards scholarships to students. Buildings were

built in the 1960s without windows to withstand a possible nuclear strike, and NASA can run as an independent community if it needs to do so. Staff still use the 1960s bicycles kept in front of buildings for short jaunts from building to building. And you can touch a Moon rock here, even if it is quite worn down from use.



NASA - White Flight control training room

The Stars Belong to Everyone by Helen Sawyer Hogg - reviewed by Don Kelly

During my annual visits to Invermere, British Columbia, I spend time at the used book store in the highly commercial, highly expensive downtown section. The basement store is like something out of Hogwarts: many of the books remain in boxes on the floor. There appears to be no record of what books are actually in the store. Fortunately, the proprietor has some recollection where categories may be found e.g., western, mystery, science, romance. Once in the stacks, I found a book by Helen Sawyer Hogg, one of our more famous members of the Royal Astronomical Society of Canada. I immediately checked to see if it had been signed by the author. Unfortunately, it hadn't.

The Stars Belong to Everyone is subtitled "How to Enjoy Astronomy" and Helen Sawyer Hogg shares with the reader her love of astronomy. She remembers when she was five years old in 1910 and seeing Halley's Comet. She is one of very few people to have seen it twice, having seen it again in 1986. Her first two chapters, "The Bag of Tricks in the Earth's Atmosphere" and "Natural Events in the Earth's Atmosphere" explain many atmospheric phenomena, including the Green Flash. Her expertise with globular clusters and variable stars, which she calls performing stars, is evident in Chapters 12 and 9 respectively.

Our RASC NB Centre membership will enjoy this book for its insight into our interest field. As she says in her acknowledgements at the beginning of the book, if you come to something that does not appeal to you, do as Winston Churchill would do – skip it. I did not find it to be a book where I wanted to skip sections. I enjoyed reading the book. I particularly enjoyed her dedication of the book to three generations of her family and "to my teachers who have inspired and encouraged my love of the stars."

Many of our membership who are active with star parties, public observing and school visitations are also inspiring and encouraging young and old alike with their interest in and knowledge of the heavens.

Green Laser Pointer – New Authorization Process

- by Chris Weadick

For years we have worked with Transport Canada to attempt to dispel the concerns of RASC members using green laser pointers (GLPs) to target aircraft. There are differing opinions regarding the value of utilizing a GLP for public outreach. It can help direct a person's attention to the location of an object versus pointing out a location in the sky to a neophyte. Conversely, will the neophyte remember where you pointed the laser two minutes later? Likely not.

In order for the public to utilize a GLP one must apply for a permit that even many RASC members find intimidating to fill out, especially the last page containing the laser specifications; only then to find out the application may be stalled in government paperwork. RASC New Brunswick Centre has been successfully submitting the application form since before 2014 but many other Centres have not had success with responses. Submitting the application is only the first step in the process. The form then needs to be reviewed, it may require a conversation with the regional representative from Transport Canada for clarification and specifics regarding distance from an aerodrome. If successful, you will receive a multipage letter confirming your approval for use of the GLP on specific days at specific times for a specific location, and the additional requirement that you also need to verify that the NOTAM (NOTice to AirMen) to confirm the pilot notification is published for the respective airports in the region. Certainly not a simple process.

With diligent work by volunteers from various RASC Centres and Transport Canada representatives we have been able to reach an agreement for approval to use a GLP for the purposes of astronomical outreach and education. You are still required to follow the same rules of use for the GLP, as well as the criteria of the Generic Letter of Authorization, but the process is simplified. What is new for the process?

- Complete the training program (PowerPoint).
- Successfully complete the test.
- Verify you are not within 10 kilometres of a Certified Aerodrome.
- Obtain approval from the Centre Executive for your event.
- Have the appropriate paperwork with you and a GLP of 5 mW maximum.
- Follow the rules regarding safe GLP use and have a spotter who has also completed the training and been certified.
- Report the event to the Centre Executive. The Society must report events to Transport Canada within 30 days of completion.

The three-page application form has been reduced to an email to your Centre Executive. Your wait time has gone from 7-10 days to next day email. This should enable members to organize and participate in more outreach events with the public and adjust for cloudy night postponements. It is all good news.

Caveat: You are representing the Society. We can lose this privilege at any time if there are members not being considerate of the process, the laws in place and the unique agreement between the RASC and Transport Canada. It takes only one to ruin it for all. At events you should complete an information session with the public regarding the requirement of approval for using a GLP and recommend the public NOT purchase one to prevent mishaps.

GLP users and spotters were always required to have training before submitting the approval form but the training was not standardized across all Centres. We now have a standard 18 slide PowerPoint training program to review the policy and process, followed with a 20 question exam to be submitted to the Centre Executive for grading and approval. The spotters and the GLP users both need to be certified to conduct outreach events with a GLP without having to complete the formal Transport Canada application form each time.

Events need to be logged with the Society through the Centre if you are using a GLP. The Society is required to submit a summary report of GLP events to Transport Canada no later than 30 days after an event so it is important to report your events in a timely fashion. To aid in the process of determining where the Certified Airports are located, the department has provided a link which displays the interactive map.

https://www.tc.gc.ca/en/services/transportation-security/aviation/hand-held-lasers-legally-safely/hand-held-lasers-prohibited-map.html

I met with the Regional Service Manager for Atlantic Canada to discuss the process because many of the seasonal/private runways are not on the certified map. The Regional Manager recommended that, although the Department has determined that the RASC is aware of the safe use of a GLP and the Department is mostly concerned with the Certified Airports, the rules of use and policy requirements still need to be abided by the users or they are in neglect of the agreement and subject to the Act regarding possible repercussions.

The Certified Aerodromes in the province of New Brunswick include the airports in Edmundston, Dalhousie, Bathurst, Miramichi, Moncton, Fredericton and Saint John, and the heliport at the Saint John Regional Hospital.

Once you have successfully completed the certification training and testing the process is:

- Send Centre Executive a notification of intent to host an event using a GLP. RASC Policy states that a non-response from the Exec after 8 hours is considered approval. (RASC NB may extend this to require approval from an Exec member rather than assume approval.)
- Confirm who your spotter will be – they also need to have been certified.
- Have a copy of your membership card with you (only RASC has the exception for with Transport Canada for GLP usage). Membership cards can be printed from the RASC website (see below).
- General Authorization letter.
- Insurance paperwork from the Society (liability insurance), which is available under the Members section of the website or via:

https://www.rasc.ca/public-liability-insurance-information.

To access your membership card:

- **Log in** to the RASC website.
- The login prompt will change to be your User Name (last name) – **click** on your User Name. If you hover over your name you will see it says

View User Profile.

- On the new page that refreshes, **click** on Update My Profile. A new page or tab will open with your membership information.
- On the right side of the page there is a title Member Documents and in blue below the description you will see your membership number and Membership_Card.pdf that you can then download and print.

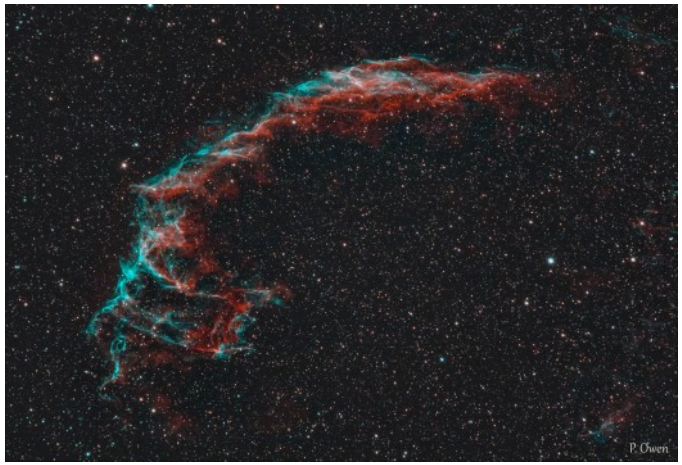
Note: This would also be a good time to verify your information is correct.

The link for the GLP information, which has many handouts and information documents, is currently available on the RASC.ca Home page or at:
https://rasc.ca/laser-pointer-usage

If you are interested in outreach it is recommended that you become certified to use a GLP as a learning aid for exploring the night sky with the public. Please consider the following guidelines from the RASC website.

In keeping with the RASC's commitment to informative, inspiring, and safe EPO, it strongly encourages its members to observe the following guidelines when using GLPs:

- Take special care not to shine GLPs in the direction of any person, vehicle, aircraft, or wildlife.
- Avoid using GLPs near any airport or airport runway approach. We suggest that GLPs not be used within 10 km of any airport.
- Use the minimum power to do the job: if a 5 mW laser is bright enough, why use a stronger one?
- Be aware that distraction and distress can be experienced by anyone illuminated by green laser light, even if the level is well below that which would cause physiological damage.
- Use good sense in storing GLPs. Don't leave lasers accessible to children. Consider removing the batteries when you are done using a GLP.



Above ↑
The Elephant's Trunk Nebula within IC 1396 in Cepheus

Paul Owen Pics

← Left
The Eastern Veil Nebula NGC 6992 in Cygnus

RASC NB Outreach Events and Handouts

Year	# of Events	People (Live Feed *)	Star Finders English	Star Finders French	Moon Guides English	Moon Guides French	Getting Started In Astronomy	Volunteer Hours
2012	75	4658	2188	229	1852	137		
2013	102	4119	1602	8	1513	120		
2014	104	4843	1716	241	1378	199		
2015	114	7262	2106	244	2568	156	819	
2016	219	9498	1984	115	2290	87	514	988
2017	248	18,453 (7533)	2276	162	2262	131	340	1944
2018	187	45,246 (37,992)	1781	170	1628	79	180	1340
2019	160	39,072 (34,451)	982	125	848	114	48	1348

* Number of people viewing Chris Curwin's telescope live feeds on Facebook (included in totals).

Types of Outreach Events

Year	Presenta-tion	Night Observing	Day Ob-serving	Youth Group	School Talks	Exhibi-tion	Observ./ Planet'm
2012	12	24	2	12	17	8	0
2013	24	24	3	12	32	7	0
2014	23	21	20	17	12	8	3
2015	22	33	23	7	15	13	1
2016	31	55	39	19	54	11	10
2017	61	89	22	19	50	6	1
2018	50	80	13	18	20	5	1
2019	44	59	7	18	28	4	0

Chris Curwin and the 2019 Qilak Award
- June MacDonald photo