

Vol. 20 Issue 1
Winter 2019

H O R I Z O N

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



NGC 7000 North America Nebula Cygnus Wall - Image by Paul Owen

No, it is not a blueprint or red-print of the infamous wall proposed between the USA and Mexico. Perhaps this one is intended to prevent flooding of the west coast of Mexico and Central America.

Actually, the Cygnus Wall is the greatest concentration of dust and gas in the North America Nebula, and subsequently the area where the most stars are forming.

Paul captured this image using a modified Canon T3i camera attached to a Stellarvue 105 mm triplet refractor mounted on a Skywatcher EQ6. Thirty exposures of 180 seconds each were processed and stacked using Photoshop.

EVENT HORIZON
Astronomy in New Brunswick

SRAC/RASC Centre du NB Centre

President/Président June MacDonald
president@nb.rasc.ca

1st Vice-President/-Président
Don Kelly firstvicep@nb.rasc.ca

2nd Vice-President/-Président
Paul Owen secondvicep@nb.rasc.ca

Secretary/Secrétaire
Curt Nason secretary@nb.rasc.ca

Treasurer/Trésorier
Emma MacPhee treasurer@nb.rasc.ca

National Council Representative
TBD

Councillors / Conseillers
Gerry Allain Joe Cartwright
Mary King Chris Weadick

LP Abatement: Curt Nason
Star Party-Events: Paul Owen
Education-Outreach: Curt Nason
Website: Laura Sponagle/Emile Cormier
Social Media: Gerry Allain
Equipment: Chris Weadick
Library: Ted Dunphy
Fundy Upgrade: Paul Owen
Newsletter Editor: Curt Nason

NB Astronomy Clubs
Réunion / Meetings

SRAC/RASC Centre du NB Centre
March 16, Moncton HS
April 13, Saint John Rockwood Park
May 18, UNB Fredericton
<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.frederictonastronomy.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
Kouch Winter Stargaze: March 2
Astronomy Week May 6 - 12

Kouchibouguac Star Party
June 7 - 8
Mount Carleton Star Party
August 2 - 3
Mactaquac Star Party July 5-6

Fundy Star Party
August 30 - 31
Kouchibouguac Fall Festival
September 27 - 28

Fall Astronomy Day and
International Observe the Moon
Night: October 5
Mercury Transit: November 11

Book Review

by Yolanda Kippers

Touring the Universe through Binoculars

Touring the Universe through Binoculars, by Philip S. Harrington
1990, John Wiley and Sons, Inc.
ISBN 0-471-51337-7

About a year ago I borrowed "Touring the Universe through Binoculars" by Philip S. Harrington from our local Astronomy Club. As a beginner to the sport, using my binoculars exclusively, I found this book to be excellent. I frequently return to my notes.

Harrington's book is readable and practical. He begins by explaining how and why binoculars are a good tool for all sky observers, not only beginners. He then guides the reader on a tour through the Universe, using binoculars.

Beginning with the Moon, an easy and obvious target, he explains how to look at the Moon's phases, pointing out the ability to observe the many varying lunar surface features, as well

as to view the lunar eclipses and occultations of stars. He then proceeds with viewing the planets, including the ability to see the phases of Venus, the moons of Jupiter, and the finding of Uranus and Neptune. The chapter on viewing the Sun includes safety measures in looking at solar features and eclipses.

Touring the Universe through Binoculars

A Complete Astronomer's Guidebook



PHILIP S. HARRINGTON

In later chapters, Harrington discusses the stars - looking for double and variable stars, asterisms, star clusters, nebulae, and galaxies. Very helpful was Harrington's division of the Messier objects into four skill levels; with the easiest (#1) being visible, near a guide star, with modest binoculars (or even with the naked-eye on a clear dark night); to the most difficult at #4, being only faint smudges of light away from guide stars, to be attempted on a very clear night. This was very helpful information that reduced a lot of frustration.

Harrington concludes with observing tricks and tips, advice anyone can use. The book does not cover the choosing and buying of binoculars. Although it is an older book (1990) updates are available. Besides, although the Universe is not static, our view of it as seen through binoculars has not changed.

Give a Dob a Chance

by Chris Weadick,
Equipment Manager

As a member of the RASC NB Centre your benefits include access to the Centre's library of astronomy books, videos, and also equipment. A listing and details of the available equipment can be seen on our website www.rasc.ca under Resources—Equipment. The current location of the equipment is also available on this page, and at the bottom is the information you will need to know regarding the policy and guidelines of borrowing equipment. Once determining what you would like to borrow you just need to complete the form at the bottom of the page. You should receive a confirmation email within a couple of days; if not please contact me directly at chris.weadick@gmail.com.

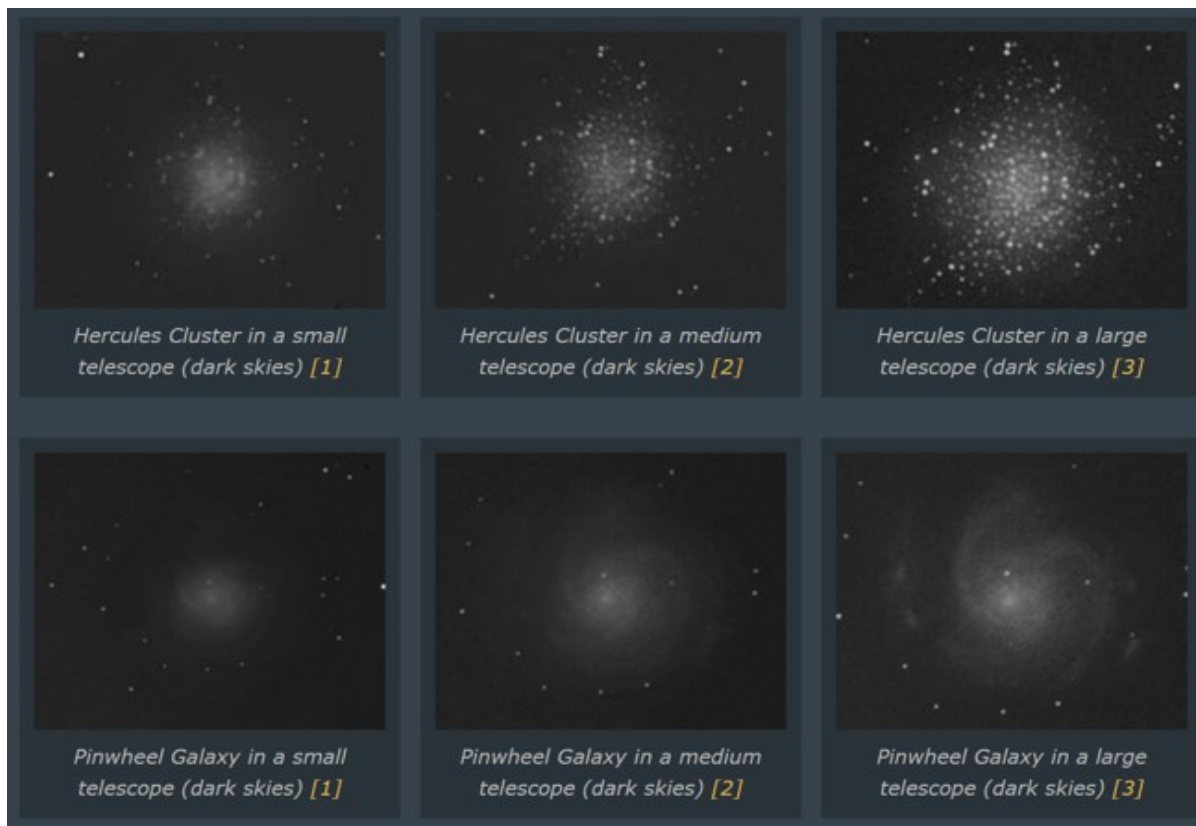
Most of the equipment is well utilized during the year with the exception of a very nice home-built 8" Dobsonian. Hand-shaped glass completed by Adrien Bordage and Marc Arsenault was later coated and various components were donated to help finish the telescope. A great size for a beginner or for someone thinking of adding a re-



flector to their current equipment list but want to try one out first. You have use of the telescope until the next provincial meeting, or if there is someone in the same city you can share it out and just update the equipment borrowing form to track movement of the telescope (or other borrowed equipment).

The 8" telescope is well-balanced on a Dobsonian mount making it one of the easiest mounts to learn how to use. A simple nudge up/down and left/right is

all it takes to move the direction of the point of view – no complicated computer setup, no pole star alignment, and no buttons or knobs to figure out; a true grab and go telescope that is simple to use the first night out. Initial target alignment is enabled with a Telrad finder which offers the full panoramic sky along with concentric rings for fine tuning and acquisition of your observing target. Many times other finder scopes will crop your view of the night sky which can be tricky for find-



(Ref: <http://www.deepskywatch.com/Articles/what-can-i-see-through-telescope.html>)

Members have borrowed the telescope to mentor other members in the use of a telescope. The pair of observers would each find a target in the night's observing list and then compare views to confirm the user of the 8" scope was able to find the object (by comparing the view with the mentor's telescope), and also to learn how to track and follow objects on their own.

In the previous year the 8" scope was not utilized. In years prior the it was on loan nearly every month. Many of the individuals who borrowed the 8" telescope have moved on to purchase their own scope, after having the opportunity to verify if they wanted a larger telescope or if an 8" telescope was large enough, as well as seeing the level of effort of taking the telescope out to observing locations.

There are many benefits of your RASC membership, besides the Journal and Observer's Handbook. The most tangible benefit is the ability to borrow from your RASC NB Library and Equipment.

ing objects. Beginner and advanced users appreciate the value of a Telrad on their telescope, even on computerized telescopes.

The aperture can also stopped down with the aperture cap for lunar observing and solar filtered viewing. Before observing the Sun, verify the filter is free from any perforations, tears, or loose fittings.

The main benefit of the larger aperture

is the amount of light gathering which will permit improved details of planets and the Moon, as well as capturing more light to see additional structure of galaxies and greater resolving power to show more stars in clusters.

The above image compares views through a 70-80 mm refractor with those of a 6" and an 8" telescope. Note the additional stars in the Hercules Cluster and the details of the dust lanes in the Pinwheel Galaxy.

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	182	45,246 (37,992)	1781	170	1628	79	180	1340
2019	20	2986 (2472)	177	0	116	0	0	95

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

Types of Outreach Events

Year	Presentation	Night Observing	Day Observing	Youth Group	School Talks	Exhibition	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	46	80	13	18	20	5	0
2019	4	7	0	4	6	0	0

CAN YOU SOLVE THIS PUZZLE CREATED BY TED DUNPHY?

Answer to the previous puzzle:
Steamy Artist:
Tropic Pictor



The answer is one astronomical word formed by rearranging the letters of the other word.

Clue: Cuban Luminary



Chris Curwin mooning at Saints Rest

- Mike Powell photo

Astronomy for Grandkids

by Gerry Allain

Our club member Colette and her husband (my ex-neighbours) sent me a message to see if I would collimate her Dob. While working on her telescope she said her son, daughter-in-law, and two grandkids would be home the following weekend, and she asked if I would do my school presentation for them.

That Friday my wife, Paulette, and I drove to their house a few streets over to spend the evening. Their grandkids were excited to see me again. I had last seen them in Montreal in 2016 while I was with Midland, waiting for a trailer back home. I had time to kill, so I called Colette's two sons who live not far from the Midland terminal to see if they wanted to go to supper. They said yes, and Alexis would bring his two kids. I showed the kids my truck and had them come inside to see how big it was.

I showed them my presentation for younger kids on their big TV as Leo is 7 and his sister Marguerite is 5. Their

parents, Alexi and Andree, stayed also. It went well and the kids were interested, Leo a bit more than his sister. He had a lot of questions and was keen on learning more.

Once done the parents went out while the grandkids stayed with grandma and grandpa (Colette and Paul) for the evening. Paulette and I stayed for a bit and chatted. They were good neighbours and we miss them.

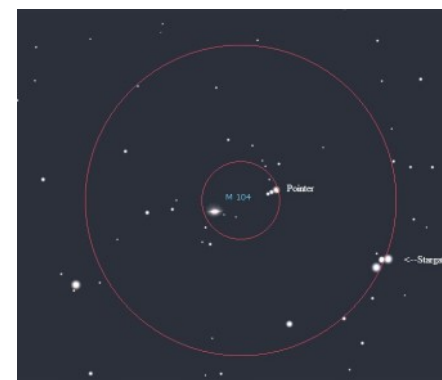


Grand-astronomers and the Big Rig

Sombrero Star hop



From midpoint of the bottom of Corvus (Kraz and Minkar), go to Algorab and extend the line almost the same distance. Look for the Stargate asterism. Follow the arrow of Stargate to a 3-star Pointer. Follow the Pointer to M104, the Sombrero Galaxy. Red Telrad circles are 0.5° and 2° wide.



Determining Optimal Settings for Astrophotography

by Trevor Johnson

The Experiment

Just over a year ago I was asked if I wanted to help with a project - one of the lunar observing certificates offered by the RASC. While I was reviewing the requirements for the certificate I decided that I wanted to do some of the astrophotography certificates as well, but before I could do that I needed a new camera, lenses, and filters. I decided to stay with some standard gear until I was sure this was something I was going to stick with. The camera is a standard Canon T6i (that has not been modified for astrophotography) and the lens I am using is the standard 18-55 mm F3.5 lens that was included with the camera (*Figure 1*).

Now that I have the gear, I need to figure out how to use it. I have been involved in photography for forty years and I have a relatively good idea how to get a nice shot, but taking pictures in the dark was something I wasn't used to. I needed to experiment a bit to figure out what would work.

Camera Canon T6i
Unmodified



Lens F3.5
18-55 mm



Filter Haida
NanoPro
Clear-Night



Figure 1: Equipment

Digital cameras are great. Being able to review pictures as soon as you take them is very convenient, but I quickly found that this did not work so well with the night sky. Unless I had the Moon or some really bright stars, it was difficult to see anything in the live view on the camera; and even reviewing the photos was difficult if the only thing in the picture was stars. I started out by taking a few shots here and there and that gave me an idea of what would work and what wouldn't, but I needed to come up with settings that would give me reasonable results every time.

I decided to be a little more systematic in my approach. I needed to take a series of photos on the same night using different ISO, aperture and shutter speeds. Around the same time that I decided to do this, my very lovely wife gave me a couple of light pollution filters. I'm not sure if that was a hint to get me out of the house more but, whatever the reason, I added the filter as another variable.

The Plan

Now that I had all the parts I needed a plan. Previous attempts gave me an idea of what settings were likely to give me acceptable results, but I was more interested in how much effect adjusting a single variable would have on the image, so the test was going to be restricted to the following settings:

ISO: 1600, 3200

Exposure (in seconds): 5, 10, 15
f-stop: 3.5

Filter: None, Light Pollution

For each ISO setting I would take one photo at each exposure setting and then repeat with the light pollution filter attached. The f-stop would remain at a constant 3.5 and the lens would remain fixed at 18 mm.

The Results

Mother Nature and a fragile power grid provided a great evening to get the photos I wanted. Switching back and forth through an entire series of photos was not the best way to compare the results so I set up a table and it worked well.

Figure 2 shows two series of photos ranging from a 15 second exposure at ISO 3200 without a filter to a five second exposure at ISO 1600 with a filter. Each image is labelled with the settings used. (NF=No Filter, LP=Light Pollution Filter). As expected, the higher ISO setting and longer exposure gives a brighter image.

There is a lot more detail in the picture on the right of Figure 3 (next page), so shouldn't we just go with the higher ISO values and the longest exposure possible? We could, but the more sensitive you make the sensor and the longer you expose it, the more noise we can expect to find in the image.

(Text continued on Page 11)

In keeping with the rules of my

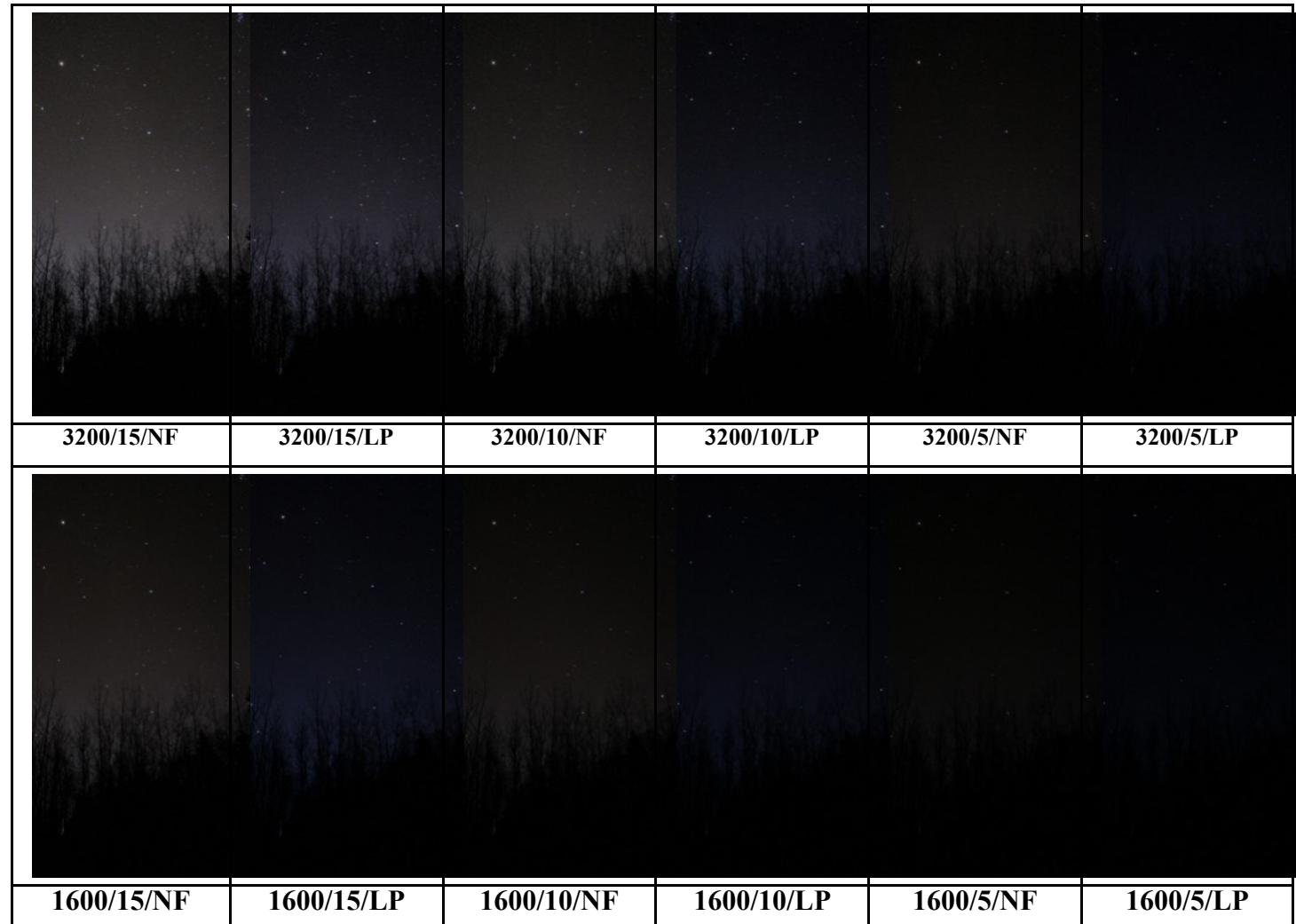


Figure 2: Test shots varying ISO setting, exposure time and filtration



Figure 3:
ISO1600 / 5 seconds *ISO3200 / 15 seconds*

Figure 4:
ISO1600 / 15 seconds *ISO3200 / 15 seconds*



Figure 5
ISO1600 / 10 seconds *ISO1600 / 15 seconds*

Figure 6
ISO1600 / 15 s *ISO1600 / 15 s*
No Filter *LP Filter*

experiment let's compare the image in the top right of Figure 3 with another that has only one parameter changed. In Figure 4 I have enlarged a section of each photo so that we can see a bit more detail. While the image on the right shows more star detail there is also a lot more noise and the only difference is in the ISO setting.

In Figure 5 I did the same thing and the only change was the exposure. In this case the amount of noise was not caused so much by the sensitivity of the camera's sensor but by the amount of light pollution that was captured. This then leads directly to our last comparison – light pollution filter or no light pollution filter (Figure 6). The specification for the filter I used indicated that it affected the image by increasing the f-stop by 0.3. In my test I did not adjust for this as I wanted to see how much of an impact the filter actually had on the image.

The most noticeable effect of the filter is on the colour of the image. The orange and yellow from the city lights has been significantly reduced giving a darker, bluer sky. While some of the light pollution has been reduced it is still easily noticeable nearer the horizon where the source of the lights is

located. The increase in the f-stop was noticeable with some of the fainter details in the original disappearing altogether. As I cannot increase the aperture on this lens I would need to compensate for the f-stop by increasing the exposure by one or two seconds.

The Final Decision

I think the perfect combination of settings is subjective to the photographer. With this camera and lens combination I can be pretty sure that I am going to be able to capture some decent imagery if I use an ISO setting of 1600 and an exposure of ten seconds. It won't have quite the detail as a longer exposure or higher ISO, but I know that I will be able to get a nice picture that I would be happy to share.

My next test will be to do this same thing using my telescope with different eyepieces and filters. This should make it a little easier the next time I am outside after midnight and it is -15C! Once I'm done with the test I think a convenient thing to do would be to print a little table with the settings I need for each application and leave it in the camera case for reference.

Will these settings work for you? May-

be. Each model and brand of camera will no doubt give slightly different results. I encourage you to get out and give it a try.

Thank You for Your Diligence

Last year our Centre members performed 182 outreach events and reported these through the RASC website for inclusion in the outreach database. This information, in particular volunteer hours, can be used by the Society to obtain grants such as the one from the Trottier Foundation to hire a Youth Outreach Coordinator.

How did we compare with other Centres in reporting? **Tops!** The Okanagan Centre was a close second with 160 events. Our two Centres accounted for 70% of the total. Sadly, only half of the 28 Centres reported events. I know most of those were performing outreach but not submitting the reports through the website.

Thank you all for your outreach and diligence in reporting. By the way, we were tops in 2016 and 2017, as well.