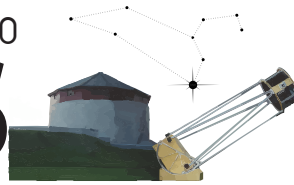


Regulus

February 2020
RASC Kingston Centre



Upcoming Meetings

Join us at our next Kingston RASC Meeting, Free and open to the Public.

Mackintosh-Corry Hall D216
Queens University Campus 7-9pm.

- February 13th, 2020
- March 19th, 2020
- April 9th, 2020

Parking is Free after 5pm on the Mackintosh-Corry Parking lot (access from Union Street near Frontenac Street)

IRRAS and GGSE-4 Satellites as they pass within 20m of earth - Malcolm Park

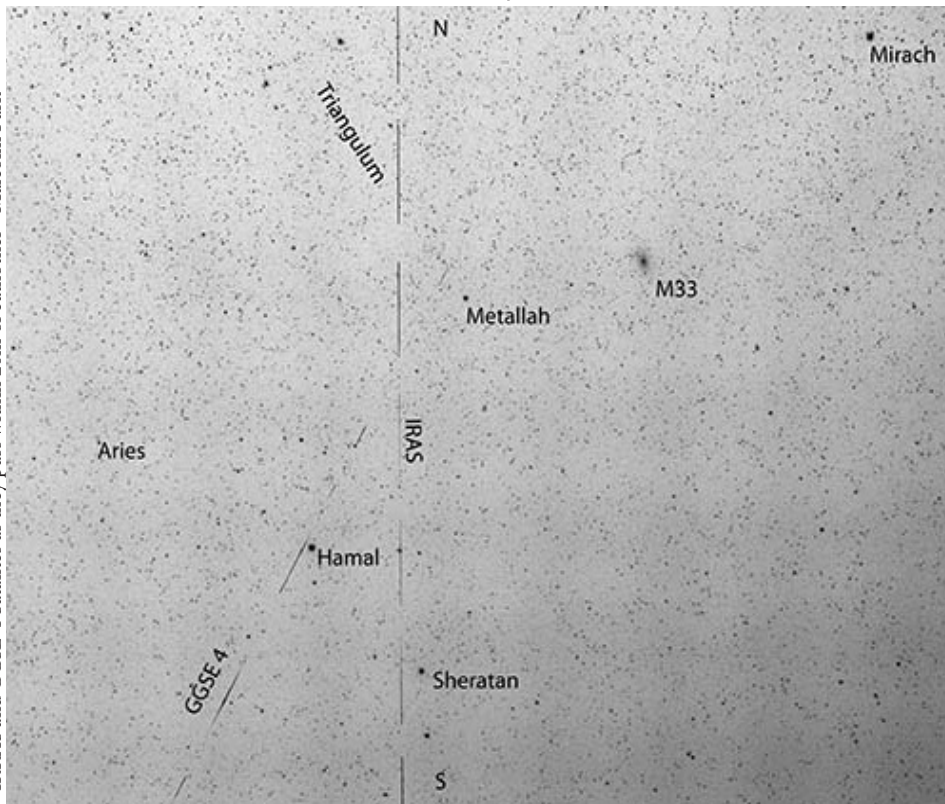


Image by Malcom Park showing the paths of satalites IRAS and GGSE-4 streaking through the night sky on a potential intercept course. Their reflectivity changing as they are both tumbling out of control at about 900km above the earth.

Technical Details:
Nikon D800 @ ISO3200
50mm Sigma Art f/1.4 lens at f/2.8
Piggy Back on AP Mach-1 Mount
25 x 5sec exposures
Stacked in Adobe Photoshop
Inverted B&W



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President's Tidbits

Welcome to 2020.

The newly formed Executive held a retreat on January 5th, too plan the upcoming year.

New ideas were discussed and were implemented at the January 9th meeting. We are now having a 15 minute segment of different topic discussions. We are welcoming the members to participate in bringing a subject they are interested in to show the rest of the members.

Attached is a list of events to date that have been filled in, and

Kim Hay

those that are TBD will be filled shortly.

Also in this newsletter and on our website are the links to the Lennox & Addington Dark Sky Viewing Area list of events, and the North Frontenac Township Dark Sky Preserve events.

We are looking for your input into the Newsletter submissions. IF you have a short or long interest piece that you would like to share please do.

There are some small projects that the Centre has that would

be great if you the members could spare an hour or two to help out it would be appreciated.

To stay in touch or send your submissions or if you have a concern or question, please send your email to kingston at rasc dot ca with the subject line of your email.

Thank you for being part of the RASC- Kingston Centre and look forward to seeing you all in February.

The RASC Kingston Centre held its Annual Christmas Dinner at the Mandarin Restaurant on Thursday December 12, 2019 at 5:00 pm.

We had 30 people in attendance . There were a few new faces in the gathering that came to the dinner, which rekindled old acquaintances.

Raffle draw tickets were handed out by Secretary Kevin Kell



Kevin Kell



Kevin Kell

Kevin Kell



for the multitude of door prizes. Though some of our members could not make the event, they donated door prizes. Thank you to many people who donated to the nights raffle draw Rose Marie, Leslie, Tessa and Kenn, Cathy Hall, Susan, Malcolm, Dieter, Hank and Di, Kevin and Kim. If I have missed anyone with the Thank you of the donation prize I am truly sorry. There were so

many that were snuck in.

Our outgoing President Rick Wagner MC'd the event with a toast to the Queen . A thank you gift too Rick for being President for the last three years was presented on behalf of the Executive and the event finished by 8:30 pm. A good time was had by all! Merry Christmas and Happy New Year with Clear Skies in 2020!

KAON Reports:

August 10th, 2019 - Brian Hunter

KAON was a mild success. Devin had the LX200 out, I tended the 6 inch Dobsonian, and Queen's students brought out the Questar. When folks first arrived from the talk, it was totally overcast but as the evening wore on, it cleared. The bright moon and bit of haze limited us to the Moon, Jupiter, Saturn, a few bright double stars. There were about 70 people at the talk.

Sept 14th, 2019 - Susan Gagnon

Wow! I am not sure if one can have too much success in Astronomy outreach but by 23:00 hours last night I was suspecting it was a possibility. Laurie, Devon and I got there early set up scopes on the roof and then joined the lecture crowd in the auditorium.

It was a great talk by Prof. Ken Clark from Queen's University on: "Fishing for Neutrinos in the Pacific Ocean". We have moved to the earlier times with the change of season, 8pm last night but October will

be 7:30.

The Centre supplied a door prize of a CSA keychain and an Astronaut icecream sandwich. Tours continued to rotate between the McDonald Institute in Stirling Hall, the dome, the warm room and the deck.

On the deck we had the club 6 inch Nexstar, Laurie and Devon's 8 inch LX200 Queen's big binoculars, and the Queen's Questar. Targets for the night were Saturn, Jupiter, the Moon, Andromeda, the Ring Nebula and Alberio. I was able to hand over the driving of the Nexstar to a Queen's student and take several groups of 2 or 3 people aside and lead them in a star hop to Andromeda with the three sets of Bushnell binoculars we keep there.

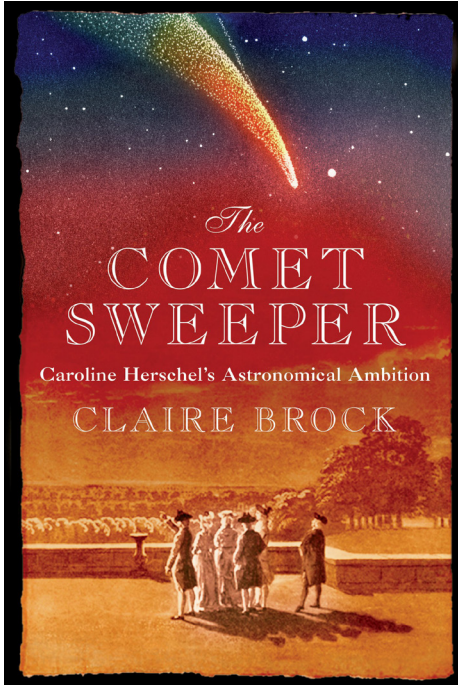
This was great fun for all of us. The full Moon made it a challenge that all enjoyed and many were successful. The seeing was not great so planetary detail was wanting but no one complained. Temperature on the deck was comfortable and the crowd did not start to thin until

Various Members

10 pm and we finally chased the last of them off at about 10:45. A great night! Head count was over 150.

January KAON - Laurie Graham

I did not get any numbers for last night but it was quite light. Since it was pouring rain I thought I was off the hook for duties but Connor put me in the lobby with a telescope. Looks like this is something that will be expected of us moving forward. Bruce Elliot and I talked to a few keen people, including four keen gals in high school. There was a woman who has a telescope who was asking Bruce a lot of questions and I talked to her friends about how to use the planisphere and what to look at with binoculars. The talk was very good and was on a new topic that was quite heady but the speaker was able to use some great analogies to make it accessible. Our estimate would be between 50 and 75 for the talk and half this for the after activities



“The Comet Sweeper: Caroline Herschel’s Astronomical Ambitions”, by Claire Brock is a shocking revelation of the trials and tribulations of a woman living in the eighteenth century.

Caroline was the youngest in a large family, and the second daughter so she was expected to keep house until she married. Education for girls, at the time in Hanover, meant she could read la-

bels on spices and make change for purchases. She taught herself much more.

Scarred by Smallpox and told she “was too ugly” to marry, she decided she needed an education. She listened at the door while her father taught the paying students. She even trained herself to sing, so she could go to England with her brother, William. Once in England, she assisted William in everything. She ground his mirrors, she turned his telescope so he did not lose his place in his observations and she translated his grunts into a usable star chart (something she received a gold medal for in 1828). She was the first woman to be paid for doing science, to discover a comet and to be elected to the Royal Astronomical Society.

Along with these highs in her life, she dealt with constant insecurity. Being a single woman in a man’s world meant she was always imprisoned by the whim of her brother.

This was a good read, at times quite exciting. I recommend this book.

Submit your Astronomy Content
(Astro Articles, Photos, Sketches, Observation Reports, Etc.)

Email Kingston@RASC.ca
“Regulus” mentioned in the
Subject line!



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RASC Kingston Centre

c/o 76 Colebrook Road,
RR#1, Yarker, ON K0K 3N0

E-mail:

kingston@rasc.ca

Website:

kingston.rasc.ca

Starfest, the North York Astronomical Association's annual amateur astronomy convention was held near Mount Forest, Ontario from August 22 to 25.

I travelled from Ottawa along Highway 7, the scenic route. The weather was great, clear blue skies, the traffic very light, and the monarch butterflies quite plentiful. I spotted several herons in the marshy areas around Tweed.

My arrival was late Tuesday afternoon, and it was high and dry for setting up my tent. We could all see lightning in the north, and dark clouds. That night, I tried to sleep. First came the raccoons rattling the handles of my cooler. Then it got



The Big Telescopes - Cathy Hall

quiet. Then came the wolves or coyotes howling in the distance. Then it got quiet. Then the storm hit. For about 4 hours, the lightning was severe and constant. There were several collapsed tents and gazebos the next morning.

Wednesday night rained lightly. Thursday night was good, with some cloud floating by in the east. Friday and Saturday were good, on cue. I was camped next to the NYAA group. Several of the OAOG group, Ottawa Valley Astronomy and Observers Group, camped beside me – Pierre Martin, and Denis and Nathalie Legault. Pierre brought his 12.5 inch Portaball scope and a solar scope, and Denis brought his dob, and telephoto for wide field shots.

We were not far from Attila Danko's 36 inch scope. Someone with a 16 inch dob came wheeling his scope across the campground just to take a photo beside the 36 inch. Attila's comment... gee, a new finder scope!

This was the first year that the skull and crossbones flag flew over Starfest. An observer from Massachusetts had his trailer made up like a pirate ship – the 'Twilight Mistress' - with masts, wheel at the helm, a corpse hanging from the yardarm, and even a carved lady as a figurehead. It was really amazing!

There were a handful of us from Kingston RASC there – myself, Graeme Hay, Steve and Donna Craig, Malcolm Park. Kudos go to Malcolm for his photos in the annual Starfest photo contest. This was



Sharing Astro Photos - Pierre Martin



South Side of Campground - Pierre Martin

Graeme's first time at Starfest. He seemed to be enjoying himself – I even caught him dancing a jig in the campground!

I thought that Thursday night was the most enjoyable. Steve and Donna came over, and with Pierre, Denis, Nathalie and myself spent the evening hopping between galaxies, nebulae and clusters. The Swan Nebula in Pierre's scope, with a Meade narrowband filter, took my breath away. It was exquisite, and almost 3D. It was the best I have ever seen it in my life. We also looked at Jupiter and Saturn. And... we found one of the current comets in Pierre's

dob, Comet C/2018 W2 Africano, down to the left of Cassiopeia in Camelopardalis. I had printed off finder charts from Greg Crinklaw's 'Skyhound' website so we could track it down. It was about magnitude 10. It was very diffuse, and faint. With averted vision, and the comet in the center of the field, you could barely see it... just a 'slightly brighter area' in the center of the eyepiece. Denis got a photo of it with his telephoto setup, and showed us on his iPad. Small, but exciting!

The talks were mainly on planetary missions and Apollo, with some on imaging. The talk by Phil McCausland on Mars and Martian meteorites was excellent, as was the talk by Auriane Egal of the University of Western Ontario, on meteors. After McCausland's talk, Pierre Martin and I had an incredible several hour private chat with him at the picnic tables. He went through about 16 different meteorite samples with us, from irons to Tagish Lake to Martian meteorites, explaining their mineral composition, inclusions and origins, and letting us examine them with a magnifier. We then got talking about the UWO meteor camera network, and after that, comet observing. The private



Steve Craig's Display - Cathy Hall

chat was the highlight of my Starfest trip.

Friday and Saturday were busy. There were a large number of University of Toronto physics students there - and they brought a planetary lander robot with them! CBC television sent a videographer, and I saw Andreas Gada of NYAA, the founder of Starfest, being interviewed.

I saw many friends whom I hadn't seen in a year, and I had some good chats about current and planned astronomical projects. Starfest was definitely worth a day's drive!



Twilight Mistress - Cathy Hall

Betelgeuse Dimming:

This is the red supergiant star Betelgeuse in the constellation of Orion. The image on the left is from 2019 October 23 and the image on the right from 2019 December 28, 67 days apart. Both are 15 second exposures but on different cameras, on the left a Canon Powershot ELPH 120 with ISO 800 and on the right a Canon 300D with ISO 1600.

Ideally one would want to use the same camera, the same ob-



Betelgeuse in Orion 2019 October 23 11:17 UTC Canon Powershot ELPH120 15 sec ISO800

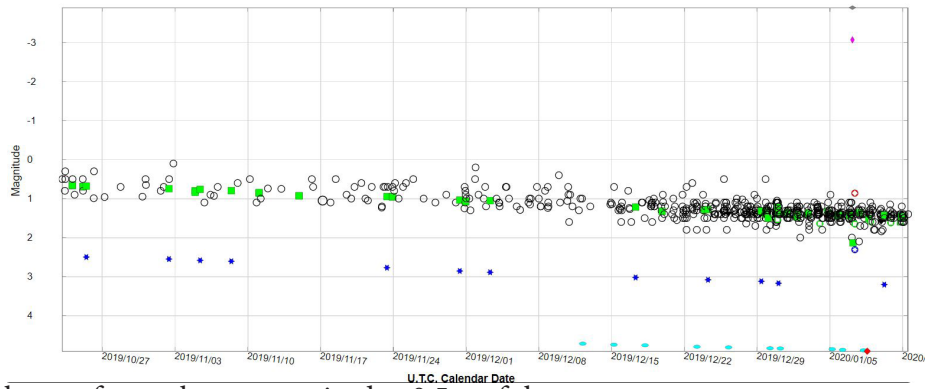
Betelgeuse in Orion 2019 Dec 29 03:19 UTC Canon 300D 15 sec ISO 1600 67 days later

Kevin Kell and Kim Hay

ject framing, same ISO and same exposures to compare, but even so, the difference in brightness stands out.

Betelgeuse has dimmed significantly in the last few months. One can also go to the AAVSO website and generate a light curve, as I have done here below, showing brightness numbers from October 23, 2019 to Jan 12, 2020.

Without numerical analysis, just looking at the curve shows a



change from about magnitudes 0.5 to 1.5. You can go here to generate your own light curve to keep track

of the star.

<https://www.aavso.org/apps/webobs/results/?star=BETELGEUSE>

Trip Report: Elbow Lake

Paul Winkler

Talks and Observing:

Rick Wagner, speaker

Graeme Hay, speaker

Doug Angle, Mark Deslauriers,

Michael Bird and Paul Winkler.

August 5th, 2019 - We set up around 7:30-8:00 PM (some arriv-

ing earlier than others) and packed it in around 10:30-10:45 PM.

At the beginning of the talks I heard there were about 45 people expected, but I'd estimate the number closer to 75; perhaps even more. All 6 telescopes were busy through the evening.

Astro Vlog: Graeme Hay



<https://youtu.be/KfAO5UGFzHl>

AstroCross:

"Astronomy Hobby"

N	A	O	B	S	E	R	V	I	N	G	E	Y
O	S	J	C	M	W	X	A	E	N	P	Y	Y
I	T	A	V	L	R	W	B	U	O	X	M	W
T	R	N	S	D	U	U	S	C	R	O	Y	E
A	O	O	J	T	L	S	S	T	N	A	C	L
C	N	T	S	A	E	E	T	O	A	E	S	G
I	O	S	E	T	L	R	R	E	I	R	A	L
F	M	G	T	E	E	T	O	P	R	L	S	C
I	E	N	T	H	S	N	E	I	A	S	O	D
N	R	I	R	A	G	Y	A	X	D	M	P	M
G	S	K	T	A	E	I	I	L	E	S	R	N
A	K	Y	P	L	S	E	N	T	P	R	R	P
M	Y	Y	P	P	S	C	S	B	B	T	K	G

- RASC
- Kingston
- Astronomy
- Night
- Sky
- Astronomer
- Stars
- Planets
- Observing
- Telescope
- Eyepiece
- Magnification
- Galaxies
- Nebulae
- Clusters
- Asteroids
- Comets
- Auras

Up coming Astronomy Events: 2020

DATE	EVENT INFORMATION	ORGANIZATION (Click for More Info)
Jan 9 th	Regular Monthly Meeting	RASC Kingston
Jan 11th	KAON - Kingston Astronomy Outreach Network	Queen's Observatory
Feb 8th	KAON - Kingston Astronomy Outreach Network	Queen's Observatory
Feb 13th	Regular meeting - 15 min presentation Peggy Hurley	RASC Kingston
Mar 14th	KAON - Kingston Astronomy Outreach Network	Queen's Observatory
Mar 19th	Regular Monthly Meeting (Note DATE CHANGE) Invited Speakers Paul Gray "Observing Nothing! Dark Nebulae Secrets", Nathan Gray "My Journey Through the Stars!" 15 min presentation Susan Gagnon	RASC Kingston
Mar 26-27th	Bruce Elliot - FLASF Science Fair -poster/ideas for projects and needs Volunteers to help out	
Apr 9th	Regular meeting {Queens Observatory Warm Room 4th floor}	RASC Kingston
Apr 11th	KAON - Kingston Astronomy Outreach Network	Queen's Observatory
Apr 25th	NFT Dark Sky Preserve- The Realm of Galaxies	NFT-DSP
May 9th	Science Rendezvous - Leon's Centre	http://www.sciencerendezvous.ca/
May 9th	KAON - Kingston Astronomy Outreach Network	Queen's Observatory
May 14th	Regular Monthly Meeting {MacDonald Hall Room 002, 128 Union St.} 15 minute presentation Malcolm Park	RASC Kingston
May 16/17th	NFT Dark Sky Preserve-The Inner Planets	NFT-DSP
May 16	L&A Dark Sky Viewing Area- Astrophotographers Assemble	L&A-DSVA
May 22-24th	South Bay Under the Stars PEC- Johnson's RV Park- Local Star Party	RASC Bellville
May 22-23th	L&A Dark Sky Viewing Area -Before the Bugs Stargazing Tour https://www.facebook.com/DarkSkyViewing/	L&A-DSVA
June 11th	Regular Monthly Meeting {MacDonald Hall Room 002, 128 Union St.}	RASC Kingston
June 13th	KAON - Kingston Astronomy Outreach Network	Queen's Observatory
June 13th	L&A Dark Sky Viewing Area-- Astrophotographers Assemble https://www.facebook.com/DarkSkyViewing/	L&A-DSVA
June 20th	NFT Dark Sky Preserve - Sun Party 1:00-3:00 pm - Seasons (rain date June 21st)	NFT-DSP
July	No July Meeting - Possible Dinner (TBD)	RASC Kingston
July 11th	KAON - Kingston Astronomy Outreach Network	Queen's Observatory
July 25th	NFT Dark Sky Preserve-Our Moon (waxing crescent at perigee)	NFT-DSP
August	No Regular Meeting- Possible Dinner (TBD)	RASC Kingston
Aug 8th	KAON - Kingston Astronomy Outreach Network	Queen's Observatory
Aug 11/12th	NFT Dark Sky Preserve- The Persid Meteor Shower	NFT-DSP
Aug 22nd	NFT Dark Sky Preserve- Three Circumpolar Constellations- Two Bears and a Dragon	NFT-DSP
Sept 10th	Regular Month Meeting	RASC Kingston
Sept 12th	KAON - Kingston Astronomy Outreach Network	Queen's Observatory
Sept 12th	NFT Dark Sky Preserve- The Outer Planets (5 visible in the evening sky)	NFT-DSP
Sept 18-20th	Fall N Stars- Johnson RV Park- Belleville hosting	RASC Bellville
Oct 8th	Regular Monthly Meeting Speaker Andrew Godefroy Title - "Reaching Out: A History of Canadian Space Robotics and the Canadarm Legacy".	RASC Kingston
Oct 10th	KAON - Kingston Astronomy Outreach Network	Queen's Observatory
Oct 10/11th	NFT Dark Sky Preserve- The Watery Constellations - or The Outer Planets(if clouded out in Sept.)	NFT-DSP
Oct 17th	Telescope Workshop- Location TBD - Volunteer's required	RASC Kingston
Nov 12th	AGM & Regular meeting	RASC Kingston
Nov 14th	KAON - Kingston Astronomy Outreach Network	Queen's Observatory
Dec 10th	Christmas Dinner - Mandarin Restaurant Frontenac Mall	RASC Kingston
Dec 12th	KAON - Kingston Astronomy Outreach Network	Queen's Observatory

Outdoor observing events are weather dependant, always check for a Go / No-Go call the day of the event.

Observation Report:

Hank Bartlett

Clear and cold today so the RHA Obs needed to be cranked open. It was -15c when I headed out at noon but once the roof was open and the door closed it was ok for a short solar imaging session.

The sun is rather featureless today but I couldn't miss the opportunity, this image really only shows one of the 5 small prominences



Hank Bartlett

and 2 filaments at the top right and left. 20200117 12:24:28EST ISO200 500ms Canon RebelXs on Solar-Max60.

I used a few different than usual processing techniques to try and highlight the surface granulation. After a half hour the MTII hand paddle display began to shut down.

Outreach Reports:

Susan Gagnon

David Levy Talk - Sept 8th, 2019

David Levy made a whirlwind trip to Kingston. David was picked up at the train, shuttled to Queen's for a lecture covering his comet hunting career and followed by a quick dinner with various Centre members. Belleville and Kingston arranged this event together and the Kingston Centre managed to get a good sup-

ply of David's latest book A Night-watchman's Journey which David signed for sale. As always...a good story teller is always welcome!

Outreach Summary 2018-2019

Over the last 12 months we have put in 380 hours devoted to outreach. This includes the KAON sessions, Guides, Science Rendezvous, City

Hall event, Elbow Lake, a mall day for the lottery and the Science Fair and a few smaller events. The total number of potential contacts comes to 2054. I want to thank everyone who played along. Outreach can be, and most of the time is, a fun thing to do. And you guys are fun to work with.

RASC Kingston Centre Treasurer Financial Report for Executive Board and Auditor, October 18, 2019. Submitted by Susan Gagnon, Treasurer.

Summary: Income \$6526.25, Expenses \$5891.41 for a net gain of \$634.84, Total assets \$30,907.46.

Fund Status: Spreadsheets, Open Office (4.1.3)

Cash float	\$5.00
Fall'n'Stars	\$533.37
Observatory	\$22,560.46
Operating	\$5657.11
Reserve	\$500.00
Special Projects	\$1,651.52

Membership at the time of reporting is 63.

Fiscal year end finances usually have some outstanding liabilities and this year is no exception. Cheques totalling \$745.79 have yet to clear and cash/cheque deposits totalling \$984.31 were not listed before the closing balance. Having said that, the ledger and the bank records do balance. After the Auditor's review and the passing of this report at the AGM there will be a transfer of excess money from Special Projects and Fall'n'Stars to the Operating account as these are now over their baseline reserve totals of \$1500 and \$500 respectively.

Some issues that can contribute to distorted profit/loss statements are: the bulk of membership renew at this time, calendar sales and invoicing are seldom in sync., and the annual Fall'n'Stars finances are seldom resolved before the close. There will also be a portion of the Levy books to be returned to National for refund. Queen's invoicing remains...random.

Income

While membership fees are a major source of income (\$1122.66), once again this is surpassed by the generous

donations of members (\$1155.00). Other sources of income included a trial run of a lottery which was somewhat labour intensive and did not raise much money (\$156.92) for outreach. A members' raffle for a donated Messier object poster from Stephen Craig also raised money (\$85). A big surprise for the Centre was a cheque that arrived from the City for a \$500 honourarium for our participation in an evening observing session downtown on July 12th. GICs also bring in more these days (\$169.25).

Expense

Expenses that we cannot avoid are very consistent: meeting room rent and Director and Officer insurance (\$361.60+\$432). Invited speakers to add variety to meeting content (\$199.38). Outreach spending is steady at \$303.84 in the general ledger plus \$144.93 from the Lottery for a total of \$448.77. Starfinders and Lunar maps from National (we pay shipping only) and a bulk rate of 50 cents per SkyNews issue make quality handouts for public events affordable.

Banking details.

We remain with the RBC branch on Gardiner's Road, hours are good and the location is convenient. When assistance is needed with things like the new account for the lottery (a separate account is required by law) it is not difficult to arrange time. We save fees by downloading e-statements. We do not however conduct any business online.

Future fundraising.

While your Treasurer was pleased to see the end of the lottery, the winner from the Ottawa Centre has regifted the binoculars and tripod to Kingston for future fundraising. The executive will have to decide how to move forward on this issue.

Notes for the Auditor

Financial year October 1 to September 30 (2018-2019)

Treasurer: current Susan Gagnon (2015-2019), past Kevin Kell (2010-2015)

Records: within the 2018-2019 Treasurer Deposit and Expense Binder please find the following,

- Summary:AGM minutes November 2018 appointing Michael Bird Auditor.
- General Ledger: Central spread sheet, all transactions.
- Lottery Ledger with receipts and statements.
- Payments, all cheques (#260-#290) issued and deposit slips.
- Reports: all monies received through RASC national through direct deposit to the Centre.
- Bank: All e-statements received from RBC.
- Investments: all statements referencing GIC status.
- CRA: papers submitted to the Canada Revenue Agency
- Equipment: inventory to be presented at the AGM November 14, 2019.

In addition to the binder I have included: Profit and Loss (1 page), a sorted Ledger account (all transactions separated by Income vs. Expense), Balance Sheet reconciling the General Ledger accounting and the RBC chequing and GICs as well as the cash on hand (1 page).

Process

Four members of the executive have signing authority for the Centre. Two signatures are required for every cheque and one must be the Treasurer's. As Treasurer I continue to hone my skills at keeping the Centre books tidy and transparent. As I have said before, the books for the Centre remain uncomplicated and CRA and National reporting is not onerous. I look forward to the report from the Auditor and any feedback from the executive or membership.