

# Saskatoon Skies

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

Volume 53, Number 04

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To view *Saskatoon Skies* digitally, see our website:

<https://saskatoon.rasc.ca/newsletters.html>

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# MEMBERSHIP? JOIN TODAY!

**Regular: \$96.00 /year**

**Youth: \$52.00 /year**

**Family: \$90.50 + \$41/additional adult + \$21.10/additional youth**

The Saskatoon Centre operates on a one-year revolving membership. You will be a member for the next 12 months no matter when in the year you join. Members are encouraged to renew early to avoid disruption in publications. Renew through the National Office at <http://www.rasc.ca/join>.

## Benefits of Membership in the Saskatoon Centre

- knowledgeable & friendly amateur astronomers
- use of the Sleaford Observatory
- use of the U of S Observatory (after training)
- Saskatoon Skies Newsletter
- Observer's Handbook
- Journal of the RASC (electronic format)
- borrow the Centre's projector to give astronomy outreach presentations – contact Les Dickson at [astrochem@sasktel.net](mailto:astrochem@sasktel.net)
- rent the Centre's Telescopes <https://saskatoon.rasc.ca/telescopes.html>
- use of the Centre library
- SkyNews Magazine (bimonthly)

## SASKATOON CENTRE'S MAIN OFFICERS:

**President** – Mike Dolan

**Vice-President** – \*vacant\*

**Secretary** – Rick Huziak

**Treasurer** – Donna-Lee May

**National Council Rep** – Les Dickson

Canadian Tire money - Darrell Chatfield

If you cannot attend a meeting but would like to donate your Canadian Tire money please email Darrell at [novachat@sasktel.net](mailto:novachat@sasktel.net).

## NEWSLETTER INFO

**Newsletter Editor** – Colin Chatfield

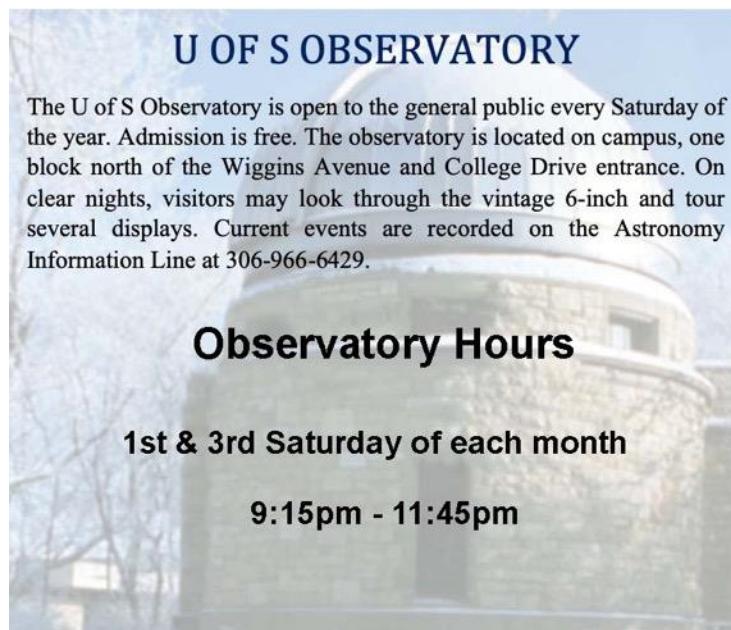
**Copy & Collate** – Les & Ellen Dickson

**Labels & Temps** – Mark de Jong

**Web Posting/Content Editor** – Gord Sarty/Tenho Tuomi

Saskatoon Skies is published monthly by the Saskatoon Centre of the RASC. Distribution is approximately 100 copies per issue. Saskatoon Skies welcomes unsolicited articles, sketches, photographs, cartoons, and other astronomy or space science material. Submissions should be sent by e-mail to the editor at [colcha@gmail.com](mailto:colcha@gmail.com) in MS Word or text format. Images (new or old): any format, less than 30MB, sent by e-mail as attached files. Send any articles of interest to the night sky or astronomy. **Deadline for submission of all articles for an upcoming issue is the first Friday of each month!**

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Website - <https://artsandscience.usask.ca/physics/facilities/observatory.php>

Facebook - <https://www.facebook.com/usaskobservatory/>

# RASC CALENDAR OF EVENTS & MEETING INFO

<b>April 18th</b>	<b>RASC General Meeting - 8:00pm (info below)</b>	Mike Dolan
<b>April 30<sup>th</sup></b>	<b>Observer's Group - Sleaford Observatory</b>	Larry Scott
<b>April 30<sup>th</sup></b>	<b>Messier Marathon Backup Night - Sleaford</b>	Larry Scott

Observer's group viewing starts at dusk at the Sleaford Observatory dark site. Get there early and set up for a great night of observing! Members and their guests only.

For a complete list of club events, please visit: <https://saskatoon.rasc.ca/activities.html>

## April RASC General Meeting for all members and guests

**Join us on April 18th, 2022 at 8:00PM (Executive meeting at 7:00pm)**  
Webinar (info below)

7:00pm - **RASC Executive Meeting** (Members may attend the executive meeting as observers if they wish)

A Zoom registration link and phone-in numbers will be emailed to Members.

After that, the procedure to register and join the meeting is the same as for the webinar (explained below).

8:00pm - **NOTE:** links to register to attend the webinar will be emailed out as well so we know who is planning to attend. After registering, an email invitation will be sent with a link to join via computer or a number to phone in. When joining via computer, participants will have to first download and install the Zoom app, if they have not done so already.

8:30pm - **Main Program - TBD**

**“What’s up this month” - Colin Chatfield & Tara Magee**

# ALWAYS NEED MEETING SPEAKERS

Rick Huziak

Hi everyone. The title of this article is *Always Need Meeting Speakers*. I titled the article that way because I always need meeting speakers. Right now, we need speakers for 10-minute slots for all months March through June and 30 – 40-minute talks for April and May. Please volunteer to talk about your favourite topic.

Online meeting attendance is also pretty low for a club that has over 80 members. Online meetings are being held because of Covid-19, but our attendance is actually less than in-person meeting attendance before Covid. Online meetings attract between 12 and 18 people even though attending is technically easier, avoiding travel and parking. Current online meetings also fulfill an initiative we had previously discussed...transmitting in-person meetings to be on-line for members that are simply too far away to attend.

So, back to speakers. With generally low attendance, I am reluctant to book external speakers who spend a lot of their time to prepare their talks then see that we have only a dozen people on-line. So, if I see larger meeting attendance I would book more external speakers. 😊 [rickhuziak@shaw.ca](mailto:rickhuziak@shaw.ca)

## MINUTES OF MARCH MEETINGS

Rick Huziak

### Minutes of the Monthly Executive Meeting RASC Saskatoon Centre Monday, March 21, 2022- 7:00 pm - Online (ZOOM)

**Attending:** Mike Dolan, Ron Waldron, Donna-Lee May, Les Dickson, Richard Huziak, Darrell Chatfield, Tim Yaworski, Grant Ursaki, Mark de Jong, Colin Chatfield, Tara Magee, Tenho Tuomi, Jim Wood.

- 1. Call to order** 7:03 PM– Mike Dolan
- 2. Approval of the February Executive Minutes** as circulated in the March newsletter.  
**Moved:** Ron Waldron. **Seconded:** Les Dickson. **CARRIED.**
- 3. Call for additional announcements/items** to add to agenda – Mike Dolan – DSP application added below.
- 4. DSP Application** – request for Letter of Support. Mike Dolan. Mike & Tim Yaworski will send a letter.

## **5. Old business:**

- Status on **Sleaford Insurance claim** - Donna-Lee May. Claim is progressing. Adjuster will go out as soon as snow clears. Darrell or someone will have to go out with adjuster to allow the adjuster access to boarded up shed. Quotes still needed for the repairs.

## **6. New business:**

- **Financial Report** – Donna-Lee May
  - RASC - Saskatoon Centre: Office Manager Stephanie at National has not provided all financial information. **A financial report will be available once this information is received.**
  - **Incoming Balance** is \$20,359.17. Income for 2021 - \$2584.98 (membership, etc.), \$540 - telescope rental, \$180 park talks, Square fee - \$394.96. Sleaford donation - \$600.00. 2021 total = \$4299.94. Balance \$24,659.11) Term 18 = \$5384.46 (currently in General Acct), Term 20 = \$2,243.79.
  - **Expenses for 2021:** \$4,138.80
  - **SSSP:** Net profit SSSP - \$1,751.80 (Retained in SSSP account).
  - **Closing Balance for 2021:** \$20,530.21
- After 2022 expenses are accounted for, approx.. \$13,000 is available for cash on hand.  
- Fundraising ideas discussed.

## **7. Sleaford Observatory Committee Proposal** – Ron Waldron / Darrell Chatfield – Tabled to next meeting.

## **8. National Council meeting report** – Les Dickson. NC meeting was held in March. Will summarize the report in the next newsletter and will bring to the Executive next meeting.

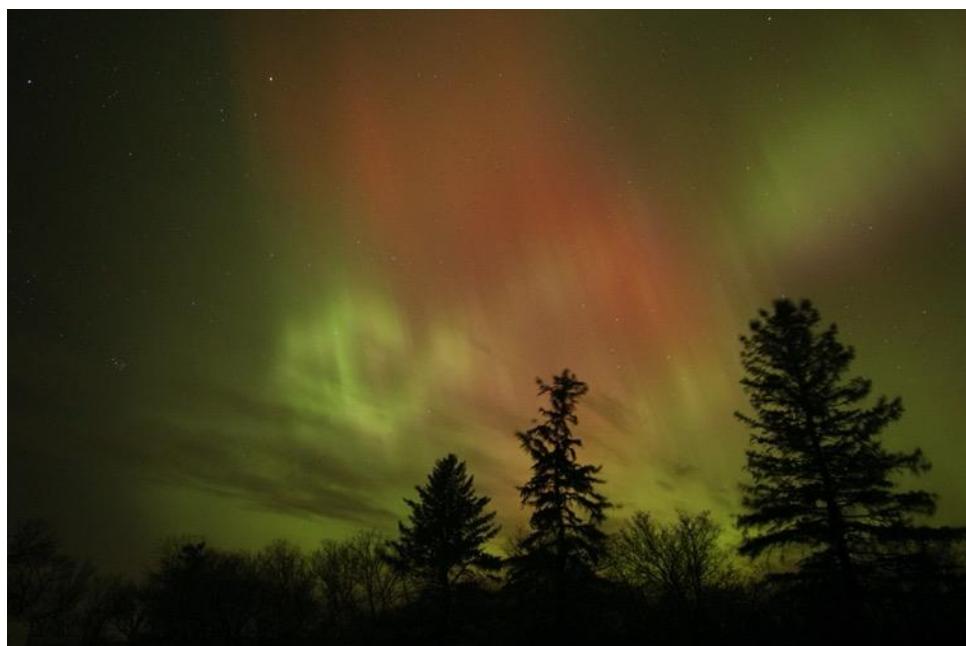
## **9. Motion to adjourn 7:56 PM. Moved:** Les Dickson. **Seconded:** Darrell Chatfield. **CARRIED.**

**Agenda for RASC Monthly General Meeting RASC Saskatoon Centre  
Monday, March 21, 2022- 8:00 pm - Online (ZOOM)**

**18 members attending at the beginning of the meeting.**

1. Sharing / Networking Time – all members
2. **Call to order** 8:15 PM – Mike Dolan

- 3. Call out to new members/guests** – Mike Dolan: New member Ashley Custer introduced.
- 4. Adoption of the February General Meeting minutes** as circulated in March newsletter. **Moved:** Les Dickson. **Seconded:** Tim Yaworski. **CARRIED.**
- 5. Executive meeting summary** – Mike Dolan. See Executive minutes.
- 6. Committee Reports:**
  - **SSSP 2022** – Les Dickson – Speakers firmed up. Planning a normal star party but depends on Covid.
  - **National Council:** Les Dickson – Liability insurance and Code of Conduct policy is being developed; volunteers may have to be vetted.
  - **Outreach:** Tim Yaworski – doesn't feel we should open for public. However, some in the club might participate using some Covid precautions. March 26 – Earth Hour. May 7 - Astronomy Day. May 14 - International Migratory Bird Day – theme is "Dim the Lights for Birds at Night!"
- 7. Financial Report** – Donna Lee May explains issues of National delays in financial reporting.
- 8. Program:** *The Upcoming Sky* – Colin Chatfield / Tara Magee  
*Repairing the Centre's 16" Meade* - Yannis Pahatouroglou
- 9. Motion to Adjourn** 9:43 PM. **Moved:** Ron Waldron. **Seconded:** Les Dickson. **CARRIED.**



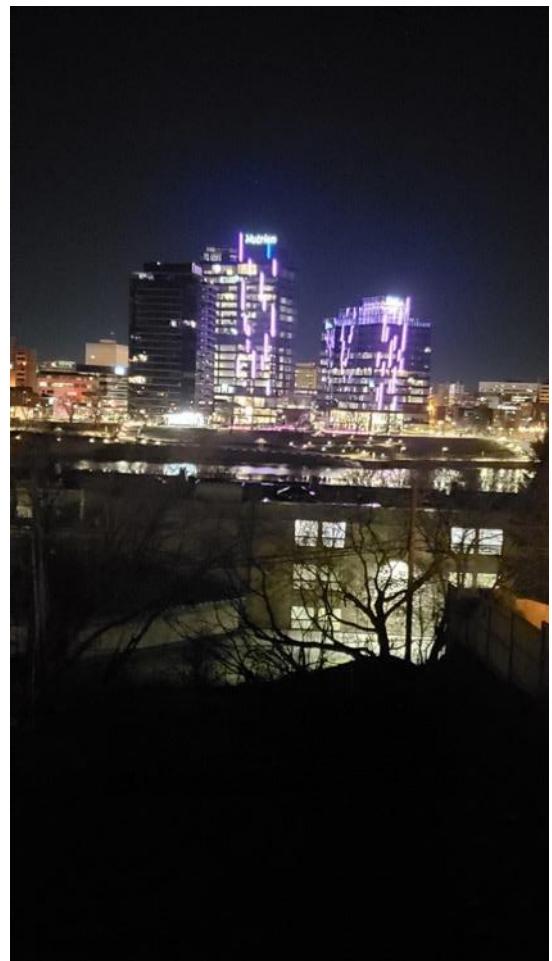
10 second exposure with Canon T5i camera at ISO 1600,  
Sigma 10-20mm lens at 10mm and F/3.5. Taken by Tenho Tuomi.

## APRIL 2022 LIGHT POLLUTION - WIN SOME, LOSE SOME

Rick Huziak - Sask Light Pollution Abatement Committee

The reason to fight light pollution is to keep lighting at a dull roar so that cities don't get brighter and lighting in rural areas doesn't dominate the environment. We are, after all, *Land of Living Skies*, meaning all 24- hours as far as we are concerned. As you can see, almost all projects involve some sort of outdoor lighting component. If only we could impress on the designers that all lighting should be dark-sky complaint, but currently that is a one-by-one job...mostly.

In January, we reported that the **RBC/Nutrient towers** were lit with LED light bars that added a lot of light pollution and generated many complaints from residents across the river who now have to look at this every night. We are also hoping that these do not become a hazard during the spring migrating bird season in May. Here's a picture from January. Since the light bars are programmable, currently they are displaying yellow and blue colours in support of the resistance of the Russian invasion of Ukraine. This is good to see, though frankly, we'd also like *not to see them at all*. Just imagine all of the downtown buildings eventually adding light bars! As you can see, just a few LED strings more than double the amount of light pollution coming from the buildings and the downtown core.



**Saskatoon Park Development Standards** – In March, we had the opportunity to comment on the lighting section of this draft document. To our great delight, the lighting for parks is proposed to be dark-sky compliant, 3 foot-candles average brightness, toward the orange or red part of the spectrum (2700K or less), and only on the main pathways. This is a really good start, but there are some exceptions noted. Our comments included dimming the average brightness to 1 foot-candle (since this is adequate in a park that is already inherently dark), assuring that sharp cut-off (SCO) fixtures are used (since the tendency is to have higher poles that would thus glare even if they had FCO fixtures), to implement time-off periods or light-on-demand (so that lights are not on all night when no one is using the park), and to make sure playgrounds are unlit (since people who are not kids tend to hang around lit playgrounds after the kids have gone home, painting graffiti and damaging things).

**Saskatoon Tree Preservation Policy** – this is another draft policy. What seems to be missing from this policy is a recommendation not to allow LED string lights on city trees (or any trees for that matter.) We might have missed the chance to comment on this policy but threw comments in late. Hopefully, they will be read. Here are the issues with LED string light on trees: The lights are never shielded, so they produce enormous amounts of light pollution. If wrapped around trunks they can strangulate the tree, kill it or stunt its growth. If wrapped around branches smaller than 2 cm in diameter, they can break branches either during installation or in the wind. Since they light the trees up all night (and in the spring, summer and fall) trees used in this way are sterile for bird life. Birds do not nest where they can't sleep, so lit trees are not urban habitat.

**Change-out of old Acorn Fixtures in the Downtown Area** – We recently noticed that many of the old acorn lights on 20<sup>th</sup> Street and the University Bridge have now been changed out to black hooded full cut-off FCO fixtures. This is great news since the acorns shone everywhere, including into 2<sup>nd</sup> story windows and up into the sky. An inquiry to Saskatoon Light and Power revealed that they are now replacing 1,000 old high-pressure sodium (HPS) acorn lights with energy efficient 3000K LED Villa Maria fixtures from Cyclone Lighting. These fixtures appear to be “sharp” cut off (SCO), even better than FCO. The project is being funded by the City of Saskatoon *Green Loan* and Federal Government *Low Carbon Economy Fund*. Saskatoon Light and Power has adopted international Dark Sky polices for light ... *when they are the only ones doing the lighting*. Here are the before and after fixtures:



So...here's a picture of 20<sup>th</sup> Street from January 23<sup>rd</sup>, *before* the retrofits were done. The acorns shown here are now replaced with the Villa Maria lights, but somewhere along the line, the *Riversdale Business Improvement District* decided that they should add LED string lights everywhere to brighten up an already too-bright street. We really wonder why Saskatoon Light & Power responsibly changes lighting to reduce light pollution when another hand just adds more. As you can see, the streets are empty at 8:51 pm (since most businesses closed three hours before) and still the street is lit up like daylight. Nobody is using the street, yet they light-pollute it and waste more energy. It makes no sense - this is our perpetual dilemma. And most of the acorn lights in the downtown area will remain since they are still considered by the Downtown BID to “look cool.”

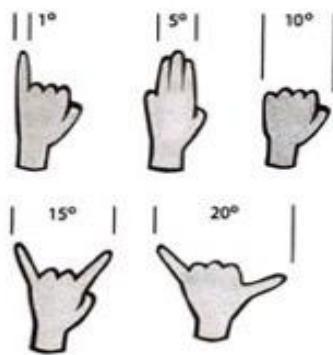


## APRIL NIGHT SKY EVENTS AND INFO

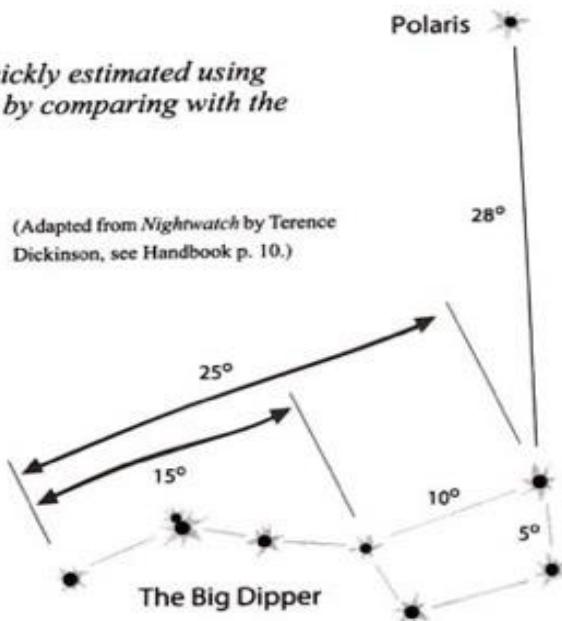
Images on the next few pages taken with permission from the 2021 Observer's Handbook. It can be obtained by joining the RASC here <http://rasc.ca/join> or ordered from <https://secure.rasc.ca/Portal/Shop/RASC/StoreMain.aspx?Category=CURRPUB>

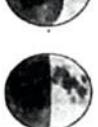
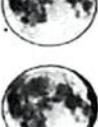
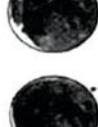
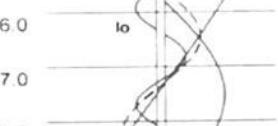
### HANDY SKY MEASURES

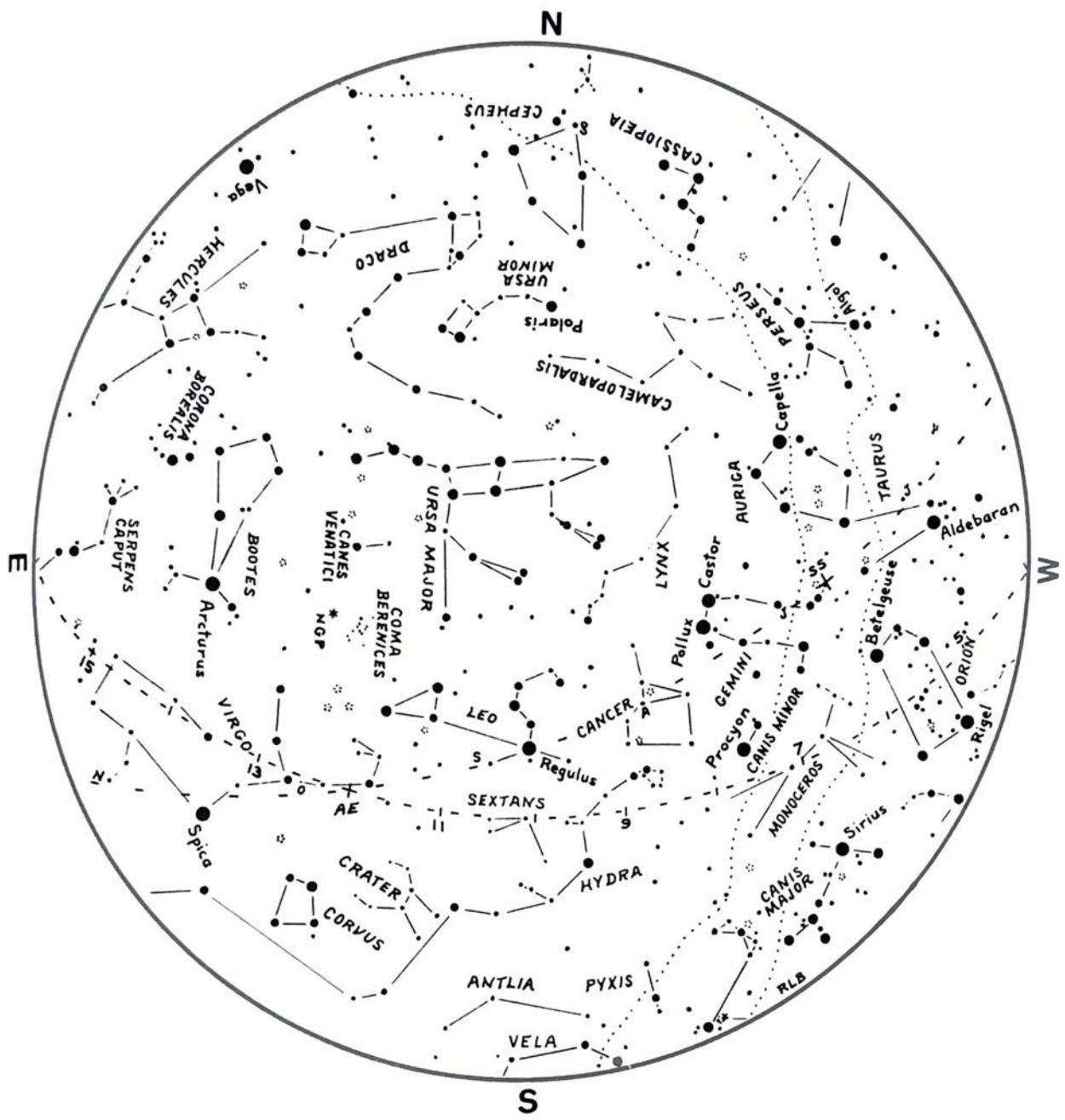
*Angular measure in the sky can be quickly estimated using the fingers of an outstretched arm, or by comparing with the star separations in the Big Dipper.*



(Adapted from *Nightwatch* by Terence Dickinson, see Handbook p. 10.)



Time (UT)			APRIL EVENTS	Jupiter's Satellites
	d	h m		West East
Fri.	1	6 24	<b>new Moon (lunation 1228)</b>	
		22 00	Algol at minimum	
Sat.	2	23	Mercury in superior conjunction	
Sun.	3	17	<b>Uranus 0.6° N of Moon, occultation†</b>	
Mon.	4	18 49	Algol at minimum	
		22	<b>Mars 0.3° S of Saturn</b>	
Tue.	5			
Wed.	6	9	<b>Ceres 0.2° N of Moon, occultation‡</b>	
Thu.	7	15 38	Algol at minimum	
		19	Moon at apogee (404 438 km)	
Fri.	8			
Sat.	9	6 48	Mercury at ascending node	
			<b>first quarter</b>	
Sun.	10	12 27	Venus at descending node	
			Algol at minimum	
Mon.	11			
Tue.	12	3	Pallas in conjunction with the Sun	
		20	<b>Jupiter 0.1° N of Neptune</b>	
Wed.	13	9 16	Mercury at perihelion	
			Algol at minimum	
Thu.	14			
Fri.	15			
Sat.	16	6 05	Algol at minimum	
		18 55	<b>full Moon</b>	
Sun.	17			
Mon.	18	13	Mercury 2° N of Uranus	
Tue.	19	2 54	Algol at minimum	
		15	Moon at perigee (365 143 km)	
Wed.	20			
Thu.	21	23 43	Algol at minimum	
Fri.	22	18	Lyrid meteors peak	
Sat.	23	11 56	<b>last quarter</b>	
Sun.	24	20 31	Mercury at greatest heliocentric lat. N	
		21	Algol at minimum	
			Saturn 5° N of Moon	
Mon.	25	22	Mars 4° N of Moon	
Tue.	26			
Wed.	27	2	Venus 4° N of Moon	
		8	Jupiter 4° N of Moon	
		17 20	Algol at minimum	
		19	<b>Venus 0.01° S of Neptune</b>	
Thu.	28			
Fri.	29	8	<b>Mercury greatest elongation E (21°)</b>	
		19	<b>Mercury 1.4° S of Pleiades (M45)</b>	
Sat.	30	14 09	Algol at minimum	
		19	<b>Venus 0.2° S of Jupiter</b>	
		20 28	<b>new Moon (lunation 1229)</b>	
			<b>Partial Solar Eclipse (p. 126)</b>	



# OBSERVERS GROUP COORDINATOR(S) NEEDED

Larry Scott

The Saskatoon Centre of the RASC is seeking one or more volunteers to take over the Observers Group Coordinator/Yard Monkey position currently held by me (Larry Scott). This position has many perks - fresh air and exercise in beautiful surroundings; works in close proximity to many bird species, butterflies, racoons, deer and gophers; the appreciation of your fellow club members; free parking; and more! Below is a list of opportunities for energetic club members that need to be passed on or not as the club sees fit.

If possible I would continue doing this for years but I'm planning a move in a few years and simply won't be here. My hope is to give the club time to consider its options and that I can pass on some tips to whomever(?) comes next.

## Observers Group Coordinator

- Set schedule for Observers Group based on dark skies(new moon) and not on a long weekend.  
(Also Messier Marathon)
- Interpret weather reports to base a go/no go decision the day of Observers Group and notify club members.

## Yard maintenance

- Mow grass or blow snow as required so yard is useful and combustibles near buildings are kept to a minimum.
- Care and feeding of snow blower and lawn mowers. \*\*\*Important\*\*\*

## Key Master

- Give tours of Sleaford to club members and hand out keys to the kingdom.

## Sleaford Open House

- |                      |                            |
|----------------------|----------------------------|
| - Set a date         | - Nag George for posters.  |
| - Distribute posters | - Nag everyone to show up. |

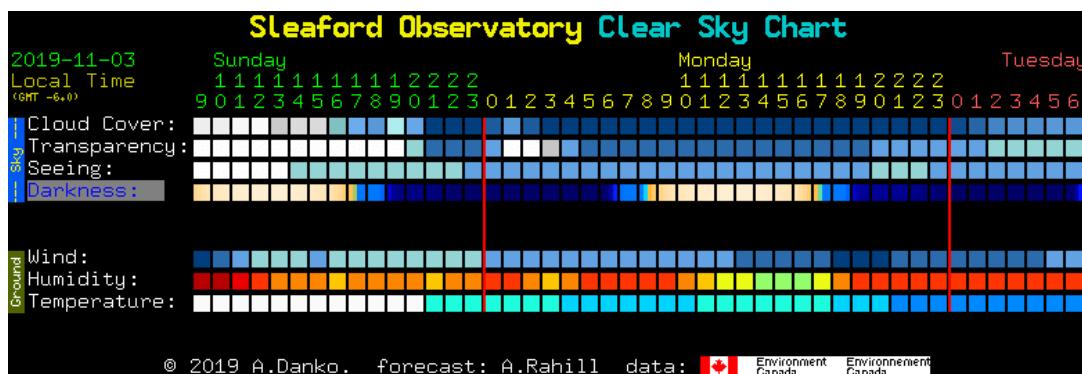
Starting in 2006 I began hosting Observer's Group meetings and as the years went on I accumulated some other responsibilities as listed above. Not sure if everything will be picked up by the members but I am hoping someone will step up to host the Observers Group and assist with these other responsibilities. Cheers for now, hope to see some of you out at Sleaford before I'm gone.

# CLEAR SKY AND WEATHER INFO

To find clear skies, visit the Clear Dark Sky website -

<https://www.cleardarksky.com/csk/>

Once there, one can enter your location to find clear skies. The chart will appear as follows:



Environment Canada provides weather information for astronomy -

[www.weather.gc.ca/astro](http://www.weather.gc.ca/astro)



Saskatchewan Light Pollution Abatement Committee -

<http://myotherlife.net/slpac/>



[www.darksky.org](http://www.darksky.org)

# NATIONAL COUNCIL UPDATE

Les Dickson - National Council Rep

This is a summary of significant items arising in the RASC National Council meeting of March 6, 2022

## The Commercial General Liability Insurance Policy and What It Covers

Over the past year, council members had been passing on to National Office (NO) questions about coverage and applicability of National's Commercial General Liability Insurance Policy with regards to Centre events. The NO collected these questions together and asked their insurance broker to produce a report answering the questions to give RASC executives and members a better idea of what is and what is not covered. The NO has now published the FAQ and a summary of the FAQ as a PowerPoint slide deck on National's website. Below are a few of the major points.

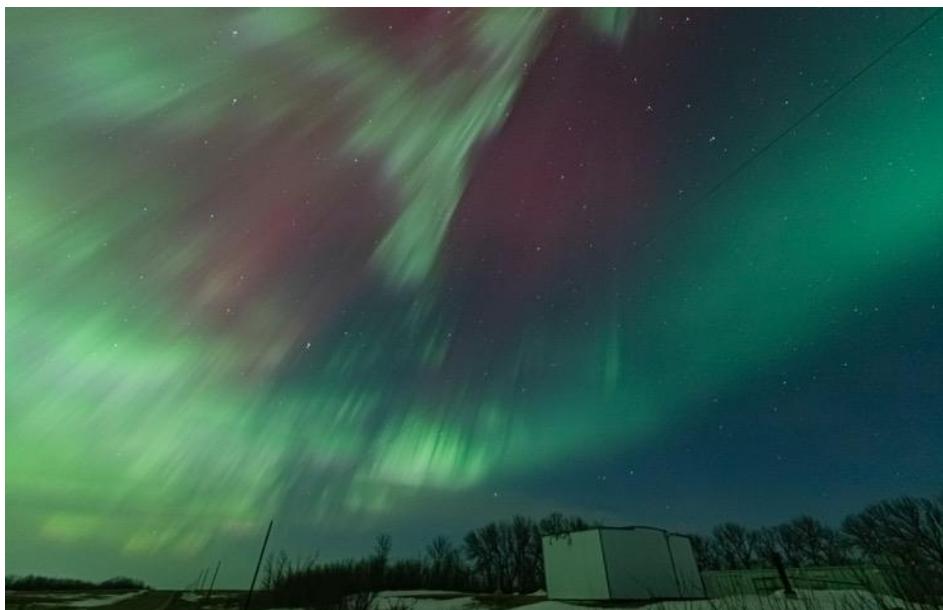
- Commercial General Liability covers liability claims against RASC and RASC Centres; it covers the organization (RASC) not individuals
- Coverage is for liability claims made for personal injury, and damage to third party property, through negligence
- CGL is not property insurance, a separate policy is required for coverage of owned property
- This policy covers activities, events that are organized by RASC and RASC Centers with regards to the promotion of astronomy and allied sciences in the form of administration, publications, distribution, and speakers visits; publication of books and other materials aimed at the beginner and advanced amateur astronomers; support of local and national education outreach programs; promotion and coordination of astronomical observing events.
- There are two questions to ask to determine if an event/activity is covered or not:
  - Is this event/activity organized by RASC or RASC centres?
  - Does this event/activity fall with the insured operation detailed above?
- Example scenarios:
  - Formal meeting + outreach (indoors): COVERED
  - Formal outreach (outdoors) with observing: COVERED
  - Formal outreach at an official observatory: COVERED
  - Informal outreach by members / volunteers; NOT COVERED
- If a public event is initiated by a non-RASC organization and the RASC has been approached to provide volunteers (i.e. ask to make presentations or set up telescopes for viewing) the insurance company recommends that the RASC ask the organization to add the RASC as an additional insured.

## **Best Practices for Centres for Public Outreach and Education Volunteers**

As part of the discussion on insurance, there was much discussion over the last year on security screening of volunteers, both members and non-members, participating in RASC-organized events. It was recognized that the conduct of volunteers could result in the RASC facing legal liability. The discussion has resulted in a draft set of Best Practices. The one-page guidance document makes a number of recommendations. Below are a few of the major points.

- Consider having a Volunteer Coordinator for the Centre who would, among other duties, maintain a roster of willing volunteers
- Do not simply use “whoever shows up” as a volunteer for a particular event
- Ensure compliance with all local laws and policies
- Consider background checks for all volunteers
- Identify and arrange any training needs for volunteers
- Discuss conflict options related to volunteers in case a problem arises during an event
- Establish a clear Centre event contact/organizer for each event
- Establish clear rules and procedures for each event
- Be aware of and comply with the rules and procedures of any partner organization involved in an event
- If any potential volunteer who is not willing to comply with the established rules and procedures cannot volunteer for that event

Once the draft document is finalized, I hope it would be posted on our website. I will be discussing this with our Executive at the April meeting.



*Tammy Vallee hanging out by Sleaford as the Aurora moved overhead and to the south.  
March 30, 2022, 10:11 pm Canon 6D Mark2 with Sigma 14mm lens F2.8 3.2 seconds ISO 3200*

# SLEAFORD 16-INCH TELESCOPE UPDATE

Ron Waldron - 16-Inch Telescope Advisory Committee

## Proposal for an Observatory at Sleaford for the Refurbished 16-inch Meade Telescope

When I rejoined the Saskatoon Centre in the fall of 2001, it did not take me long to discover that the club had a dream for their newly acquired Sleaford Site. That dream was to build a 16-inch telescope complete with observatory on the site.

The opportunity presented itself to the club when I was its president in 2006. The Toronto Centre was upgrading its facilities. The information about the telescope as it was communicated to us and to the membership was as follows: a Meade 16" Classic LX200 EMC GOTO Schmidt-Cassegrain optical system with 2" Meade Diagonal with 1.25" adaptor plus other accessories. Basically, it was as seen below minus the pier.



A meeting of the executive was held in early August of 2006 to decide whether or not to purchase this telescope. At the close of the meeting, the vote was a unanimous "yes". The purchase of this telescope was considered at the time to be a major step toward completing our primary goal of having a 16" telescope for the membership to use. Vice president Garry Stone offered to pick it up and bring it home while visiting his daughter in Toronto in late September or early October. U of S astronomy educator and RASC member, Stan Shadick kindly offered temporary mounting of the telescope on a vacant pier in the roll off dome at Sleaford in exchange for some usage by students.



**Member Bill Hydomako in front of the 16-inch telescope first mounted in the U of S Roll-off Shed (*photo courtesy of Jeff Swick*)**

A lot has happened since then. The telescope upon arrival was fraught with “issues” that required immediate attention if it was to be used effectively on site. Several attempts were made by a variety of members to deal with its issues with no real satisfactory results. So in the summer of 2021, when I was president again, I asked Yannis Pahatourglou if he would consider refurbishing from stem to stern in the comfort of the Physics Department. Thankfully he said yes, which brings us to where we are today. A working 16-inch telescope waiting to be mounted on a dedicated telescope pier beneath some sort of observatory structure to be built on the Sleaford Site.

A Sleaford Observatory Committee was setup in November of 2021 consisting of members Darrell Chatfield, Jeff Swick, Payton Byrns, Tim Yaworski, incoming president Mike Dolan, and myself. The design decided upon was an 8 X 10 shed to be built on the site of the old Patterson observatory (see photo) with a roll-off roof.



**The old Patterson Observatory (now removed) – future site of the roll-off shed and 16-inch (*photo courtesy of Jeff Swick*)**

Darrell Chatfield went to work on the design and preparation of estimates for construction. The decision was made to use the same contractor that constructed our large shed at Sleaford with help from us in getting the roll-off roof correct. The total cost estimate, however, was high and thought to be well above what the club can afford.

So the committee (specifically Darrell Chatfield) went about investigating the concept of a roll-away observatory, an idea put forth by member Tim Yaworski. This concept permits a standard shed to be built on tracks embedded in concrete which then is rolled away from the telescope itself. It is felt that this observatory could be built much cheaper. (see photo)



Another recommendation from the committee was to house the telescope under the existing roll-off owned by the U of S and make it robotic. Member Daryl Janzen had indicated over a year ago that they had the space to house the telescope and time on it could be shared by both Saskatoon Centre members and the U of S. This was, however, almost as expensive as building our own roll-off structure.

Finally, the committee investigated selling the newly refurbished telescope.

The committee members will present their recommendations to the executive along with prices at the April executive meeting to be held on Monday, April 18<sup>th</sup>.



*Tim Yaworski captured the Orion Nebula during one of the rare, clear nights this winter. It is now ducking out of sight as we look forward to our summer sky.*



## BOOKS FOR SALE

All books are in either new, or like new condition. Retail price in brackets. Please email at [novachat@sasktel.net](mailto:novachat@sasktel.net) or text/call 306-222-0515 if you want a particular book to make arrangements. All books being sold by Darrell Chatfield.

<b>“Deep-Sky Observers Handbook”</b>	Volume 1-5	Enslow-Lutterworth	\$40.00
<b>“International Encyclopedia of Astronomy”</b>	1987	Patrick Moore	Color \$10.00
<b>“Backyard Astronomers Guide”</b>	T. Dickinson & Alan Dyer	2008	Color \$25.00
<b>“Atlas of Deep Sky Splendors”</b>	1978 H. Verhenberg	(50.00)	B & W \$22.00
<b>“Amateur Astronomers Catalog of 500 Deep Sky Objects”</b>	Vol 1	1980 B & W R. Morales	\$15.00
<b>“Observing the Constellations”</b>	1989 J. Sanford	Color charts	\$10.00

## OBSERVING CERTIFICATES AND CLUBS

### RASC OBSERVING PROGRAMS AND CERTIFICATES

The RASC offers four observing certificates for members who observe all objects in each of the following observing lists in this chapter:

- THE MESSIER CATALOGUE (p. 314)
- THE FINEST NGC OBJECTS (p. 318),
- THE DEEP-SKY CHALLENGE OBJECTS (p. 322),
- DEEP-SKY GEMS (p. 324).

See [www.rasc.ca/certificate-programs](http://www.rasc.ca/certificate-programs) for details and contact the RASC Observing Committee Chair at [rasc.ca/contact/observing](http://rasc.ca/contact/observing) for further information.



The RASC also offers the **Explore the Universe Certificate** for novice observers (who do not have to be RASC members), the **Explore the Moon Certificate** for beginning members, and the **Isabel Williamson Lunar Observing Certificate** for intermediate to advanced members. In addition, **Astroimaging certificates** are available for those members with a photographic bent. See [www.rasc.ca/astro-imaging-certificate](http://www.rasc.ca/astro-imaging-certificate)

### RASC OBSERVER'S HANDBOOK 2020

Join the Club! Observe all 110 Messier, 110 Finest NGC, 400 Herschel I or II, 140 Lunar, 154 Sky Gems or 35 Binocular objects, or Explore the Universe and earn great OBSERVING CERTIFICATES!

#### **MESSIER CLUB**

##### **Certified at 110 Objects:**

*R. Huziak, G. Sarty,  
S. Alexander, S. Ferguson,  
D. Chatfield, T. Tuomi, L.  
Scott, G. Charpentier, B.  
Johnson, L. Dickson,  
B. Burlingham, Norma Jensen,  
Donna-Lee May*

Ron Waldron	108
Marcel Müller-	94
Goldkuhle	
Wade Selvig	75
Wayne Schlakohl	43
Ellen Dickson	34
Graham Hartridge	9

#### **CHATFIELD BINOCULAR CERTIFICATE**

##### **Certified at 35 to 40 Objects:**

*T. Tuomi, R. Huziak*

Jim Goodridge	12
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#### **FINEST NGC CLUB**

##### **Certified at 110 Objects:**

*R. Huziak, G. Sarty,  
D. Chatfield, T. Tuomi*

Larry Scott	110
Scott Alexander	97
Norma Jensen	83
Sandy Ferguson	23
George Charpentier	13

#### **EXPLORE THE UNIVERSE**

##### **Certified at 55 to 110**

**Objects:** *T. Tuomi,*

Wayne Schlakohl	55
Jim Goodridge	35

#### **HERSCHEL 400 CLUB**

##### **Certified at 400 Objects:**

*R. Huziak, D. Chatfield,  
T. Tuomi*

Gordon Sarty	251
Scott Alexander	117
Larry Scott	45
Sandy Ferguson	18

#### **HERSCHEL 400-II CLUB**

Darrell Chatfield	400
Tenho Tuomi	378
Rick Huziak	246

#### **ISABEL WILLIAMSON**

#### **LUNAR OBSERVING CERTIFICATE**

##### **Certified at 140 Objects:**

*T. Tuomi, N. Jensen*

#### **EXPLORE THE MOON CERTIFICATE**

*T. Yaworski*

#### **LEVY DEEP-SKY GEMS**

##### **Certified at 154 Objects:**

Tenho Tuomi	150
Darrell Chatfield	70

The Messier, Finest NGC and David Levy's Deep-Sky Gems lists can be found in the *Observer's Handbook*.

The Explore the Universe list is available here <http://www.rasc.ca/explore-universe>  
On-line Messier and Finest NGC lists, charts and logbooks:

<http://www.rasc.ca/observing>

On-line Herschel 400 List:

<http://www.astroligue.org/al/obsclubs/herschel/hers400.html>

Binocular List is at: [https://www.usask.ca/rasc/Chatfield\\_Binocular\\_List.pdf](https://www.usask.ca/rasc/Chatfield_Binocular_List.pdf)

“Isabel Williamson Lunar Observing Program Guide”:

<http://www.rasc.ca/sites/default/files/IWLOP2015.pdf>

Program details can be found at: <http://www.rasc.ca/williamson/index.shtml>