

# Saskatoon Skies

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

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Royal Astronomical Society of Canada  
Saskatoon Centre Incorporated  
Box 31086, RPO Broadway  
Saskatoon, SK S7H 5S8

WEBSITE: <https://saskatoon.rasc.ca/>

E-MAIL: [sk\\_centre@rasc.ca](mailto:sk_centre@rasc.ca)

FACEBOOK: [RASC Saskatoon Centre](#)

INSTAGRAM: [@RASCYXE](#)

To view *Saskatoon Skies* digitally, see our website:  
<https://saskatoon.rasc.ca/newsletters.html>

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# MEMBERSHIP? JOIN TODAY!

**Regular: \$111.00 /year**

**Youth: \$61.10 /year**

**Family: \$105.50 + \$42.90/additional adult + \$22.20/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 – \*vacant\***

**Vice-President** – Brent Berlingham

**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 old Canadian Tire money please to assist with club purchases, email Darrell at [novachat@sasktel.net](mailto:novachat@sasktel.net).

## NEWSLETTER INFO

**Newsletter Editor** – Colin Chatfield

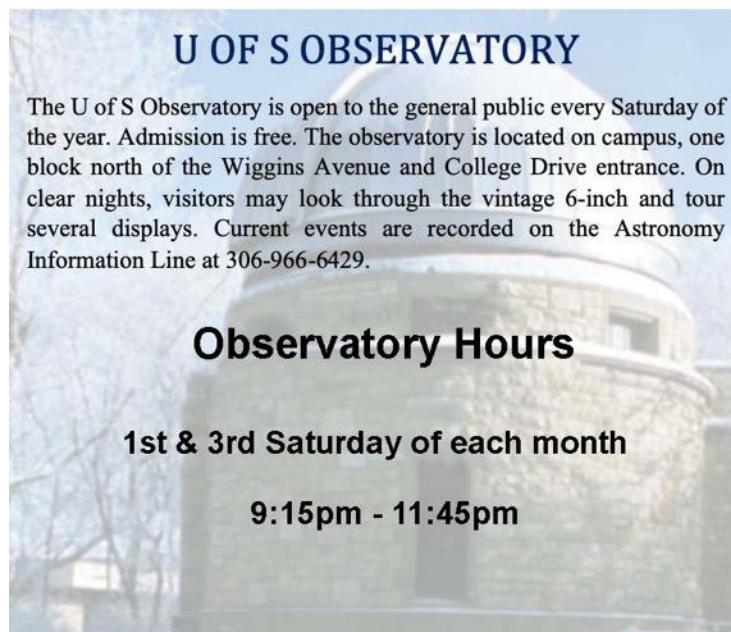
**Copy & Collate** – Les & Ellen Dickson

**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!**

Saskatoon Skies is also posted on our Saskatoon Centre homepage as a .pdf file and can be downloaded free-of-charge. Members may choose to receive the newsletter by regular mail or via the Internet. Articles may be reprinted from Saskatoon Skies without expressed permission (unless otherwise indicated), provided that proper source credit is given. Saskatoon Skies accepts commercial advertising. Please email the editor at [colcha@gmail.com](mailto:colcha@gmail.com) for rates. Members can advertise non-commercial items for free.



Hours subject to change, so check below for more info -

Website - <https://artsandscience.usask.ca/physics/facilities/observatory.php>  
Facebook - <https://www.facebook.com/usaskobservatory/>

# RASC CALENDAR OF EVENTS & MEETING INFO

<b>Nov 19</b>	<b>Observer's Group - Sleaford Observatory</b>	Brent Gratias
<b>Nov 21</b>	<b>RASC Saskatoon Centre General Meeting</b>	

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>

## November RASC General Meeting for all members and guests

**Join us on November 21<sup>st</sup>, 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).

**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.

**8:15pm - Main Program -**  
**“What’s Up This Month?”** – Colin Chatfield, Tara Magee

**“3D Printing a Small Telescope”** – James Chapman – James will describe how he and his son 3D printed a small, completely functional telescope and viewed the stars!

# MINUTES OF OCTOBER MEETINGS

Rick Huziak

## Minutes of the Monthly Executive Meeting RASC Saskatoon Centre Monday, October 17, 2022 - 7:00 pm Online (ZOOM)

**Attending:** Rick Huziak, Donna-Lee May, Les Dickson, Tenho Tuomi, Colin Chatfield, Darrell Chatfield, Mark de Jong, Ron Waldron, Mike Dolan. Later: Patty Gakis.

1. **Call to order** 7:04 pm – Rick Huziak.
2. **Approval of the September Executive meeting minutes** as circulated in the October newsletter. **Moved:** Les Dickson. **Seconded:** Donna-Lee May. **CARRIED.**
3. **Approval of the Special (October 2) Executive meeting minutes** as circulated in the October newsletter. **Moved:** Donna-Lee May. **Seconded:** Les Dickson. **CARRIED.**
4. **Call for additional announcements/items** to add to agenda – Rick Huziak. None requested.

### Old business:

5. **Loaner Scope Report** – submitted in writing by Ike Thiessen (reported by Rick Huziak)
  - 2 scopes and binoculars have been picked up from Nigel West
  - Telrad (Sept. minutes) has been purchased & reimbursed
  - \$140 is reported from recent rentals since January 1.
  - All three 8" Dobsonians are currently rented.
  - Ike & Rick will meet Oct. 18 to inventory the new telescopes.
  - Check with Darryl Janzen as to who has access to the Observatory basement with respect to security of our equipment. – Ron Waldron. Rick will follow up.
6. **Treasurer's Report** – Donna-Lee May
  - **Insurance claim** – Claim has been accepted. (~\$4800 - \$5000) – partial coverage for shed repair & snowblower replacement. Exact number will be reported later.
  - **Purchase of replacement snowblower** – had *Ariens 926083 Professional* 28 Snowblower costing \$4020. Looking for a similar replacement. New executive will have to decide if additional money will be allocated to buy the equivalent machine or to buy a lesser one.
  - **2021 - 2022 Year End** – Year end is Sept. 30. Receipts continue to come in late causing delays in year-end processing.
  - **Corporations Branch update** – Sorted out - waiting for a new President to list on the form. \$40 application fee has been refunded due to their error. Costs may include \$50 for changes & \$10 for issuing of the Certificate.

- **Utilities statement from U of S for Sleaford** (via Daryl Janzen) – **Donna-Lee May** – for \$822.24 (2020-21) & \$945.68 (2021-22) – waiting for a formal invoice from the Physics dept.
- **Copy of Sleaford Agreement** to be sent to Physics dept at Dept. Head Michael Bradley's request.
- **Inventory of Centre Assets** needs to be made for insurance purposes.
- **Insurance Premium (2022-3)** = \$1380.12 due Oct. 27. PAID. Premium can be adjusted after the asset audit.

**7. SSSP'22** – Rick Huziak.

- Official attendance was 302.
- All refunds have been issued. Working on final books.
- Regina T-shirt costs have been paid.
- Partial disbursement back to RASC Saskatoon GL (“Resort loan”) will follow.
- Speaker reimbursement for Thursday evening (Zalcik) talk (\$250) has been received from Saskatchewan Parks.

**8. Sleaford Committee Report - other maintenance at Sleaford this summer** – Darrell Chatfield.

- Rekeying of Sleaford – Darrell may be able to do the bulk of himself using 2022-3 budget.
- Electrical outlet extensions on Roll-off – Darrell may be able to do depending on weather using the 2022-3 budget.
- Exit ramp on shed is complete.
- Mice in bathroom needs to be investigated.
- Bee-stripes on deck nose boards need to be painted.

**New Business:**

**9. Members are requested to maintain respectful communications** in RASC meetings – Rick Huziak

**10. In-person meetings** – Donna-Lee May – suggests a potluck meeting for our December Christmas meeting. Bring up in November with new Executive. (Infections still are happening.)

**11. Discussion on elections & future of the Centre** – all.

**12. Call to adjourn – Moved:** Les Dickson. 7:56 PM. **CARRIED.**

**Minutes of the Monthly General Meeting (Annual General Meeting)  
RASC Saskatoon Centre  
Monday, October 17, 2022 - 8:00 pm Online (ZOOM)**

**18 members on-line at beginning of meeting.**

- 1. Sharing / Networking Time** 8:00 PM – all members
- 2. Call to order** – 8:16 PM – Rick Huziak
- 3. Call out to new members/guests:** (introductions during public session.) – No call-outs necessary.
- 4. Adoption of the September General Meeting minutes** as circulated in the October newsletter. **Moved:** Les Dickson. **Seconded:** Donna-Lee May. **CARRIED.**
- 5. Executive Meeting summary** – Rick Huziak
  - See Executive Minutes
- 6. Call for additional items or changes to the agenda** – Rick Huziak – none added
- 7. Outreach Activities** – Patty Gakis
  - **Oct 1 - Open House at Sleaford** – Excellent clear sky. 250 attendees; ran event with 5 members. This did not allow us to do much other interaction with the attendees other than showing views through the scopes.
  - **Oct. 17- Classical Conversations International School report** (for instructor Ciska du Toit) – Patty Gakis – Patty and Rick Huziak did event in Neuanlage, SK. Approx. 50 young kids and 10 parents. Rick did a talk and Rick & Patty showed the sun with telescopes.
  - **Oct 28 - Dark skies at the Creek** – Rick Huziak – MVA has requested a talk and star night at Beaver Creek Conservation Area 20 km S of Saskatoon on Hwy 219 – please contact Rick to volunteer. RASC will be paid.
  - Patty looking into **Girl Guides & Scouts** programming to support badges.
- 8. New Business:**
  - **RASC Calendars** are available @ \$20 each. Contact Donna-Lee May. Calendars were double shipped from National.
- 9. Election of Officers**  
**Introduction of rules** – Rick Huziak:
  - Nominations have occurred before the meeting but may also be made now. Multiple nominations/challenges to the position are welcome without prejudice.
  - Nominees have been or will be asked if they will accept the nomination and stand.
  - Single nominations will be acclaimed unless there is objection from the floor.

- Multiple nominations will be voted on by a show of hands to select the winner.
- Open positions after the October elections will be deferred to the new Executive to fill.
- The new Executive assume their duties immediately after the termination of this meeting.

**Motion to open Nominations from the floor.** (Note – nominations were generally opened in the Sept. newsletter notice): Rick Huziak. **Seconded:** Ellen Dickson.

**The following positions were nominated, accepted and acclaimed:**

**Vice-President** – (2-year term) – Brent Burlingham

**Secretary** - Rick Huziak

**Treasurer** - Donna-Lee May

**Librarian/Archivist** – Darrell Chatfield

**Newsletter Editor** – Colin Chatfield

**Web Content Writer** – Tenho Tuomi

**Sleaford Maintenance Coordinators** – Darrell Chatfield, Rick Huziak, Brent Gratias

**Observers Group Coordinators** – Brent Gratias

**Membership Coordinator** – Mark de Jong

**Telescope Rental Coordinators** – Ike Thiessen

**Photographers** – George Charpentier, Colin Chatfield

**Social Media Coordinators** – Colin Chatfield, Patty Gakis

**Observing Certificate Coordinator** - Darrell Chatfield

**Move to accept the slate of people** who have accepted position but to leave nominations open for unfilled positions below. – Donna-Lee May. **Seconded** - Ellen Dickson. **CARRIED.**

**The following positions remain unfilled** (or nomination are not yet accepted) and are deferred to the November meeting:

**President** – (2-year term) – vacant

**Activities Coordinator** – vacant

**Webmaster** – current Andrew Kostiuk. **Nominated:** Andrew Kostiuk (not yet accepted)

**Speaker Coordinator** – vacant

**Since the term ended without a President**, a Past-president will not be listed.

**Meeting Room Coordinator** – Rick Huziak suggest that this position is deleted until it is defined as needed. **Move to remove this position:** Rick Huziak. **Seconded:** Donna-Lee May. **CARRIED.**

**Board of Directors** – elected as follows. Board of Directors slate is **CARRIED.**

- Les Dickson
- Norma Jensen
- Tenho Tuomi
- James Wood

**Note:** Committees and National Council Representative can be affirmed at the New Executive in the November meeting.

**10. Motion that the membership** resolve not to appoint an auditor nor a person to conduct a review of the Financial Statements for the ensuing year per Section 150 of the *Non-profit Corporations Act, 1995* - **Jim Gorkoff. Seconded:** Jim Wood. **CARRIED.**

**11. Programs:** *Deferred due to time.*

**Call to adjourn** – 9:45 PM. **Moved:** James Wood. **CARRIED**

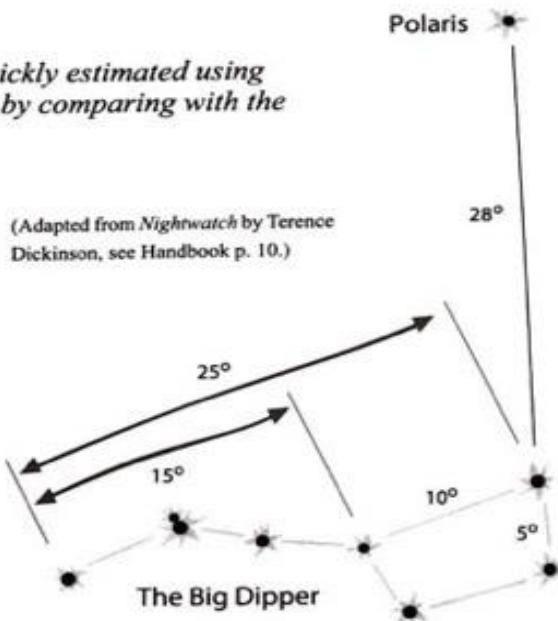
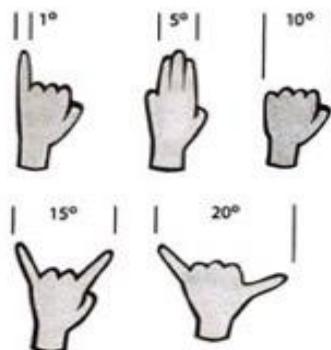
## NOVEMBER NIGHT SKY EVENTS AND INFO

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>

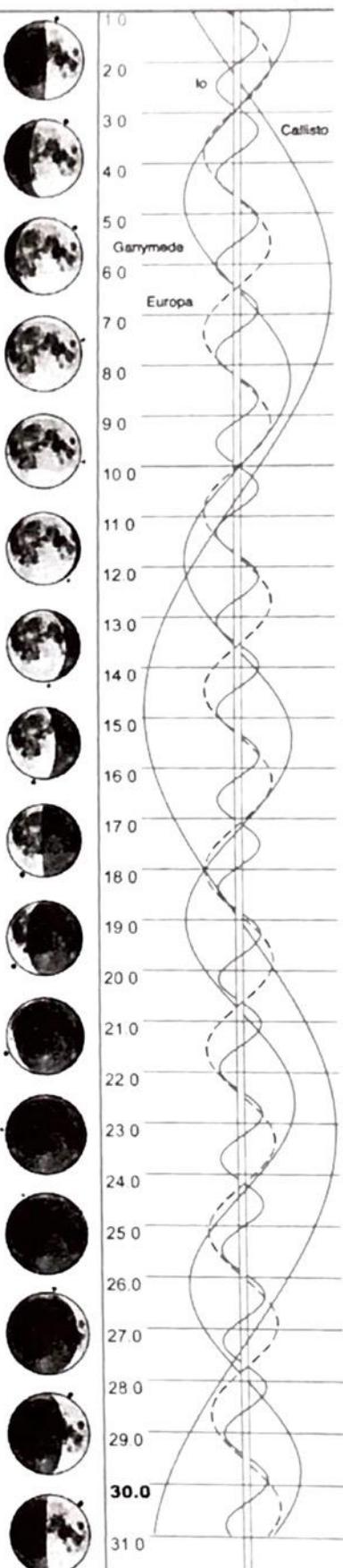
### HANDY SKY MEASURES

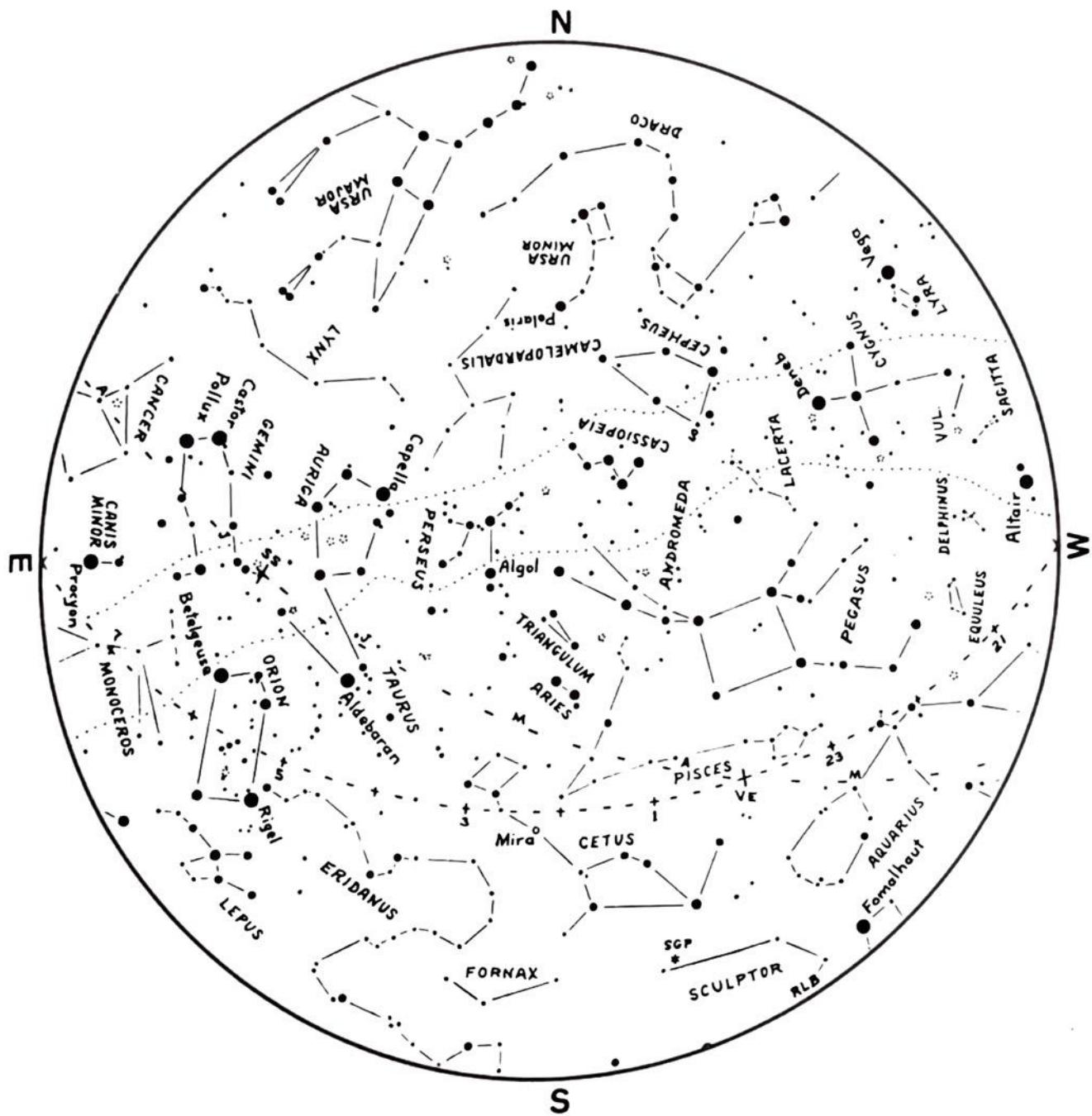
*Angular measure in the sky can be quickly estimated using the fingers of an outstretched arm, or by comparing with the star separations in the Big Dipper.*

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



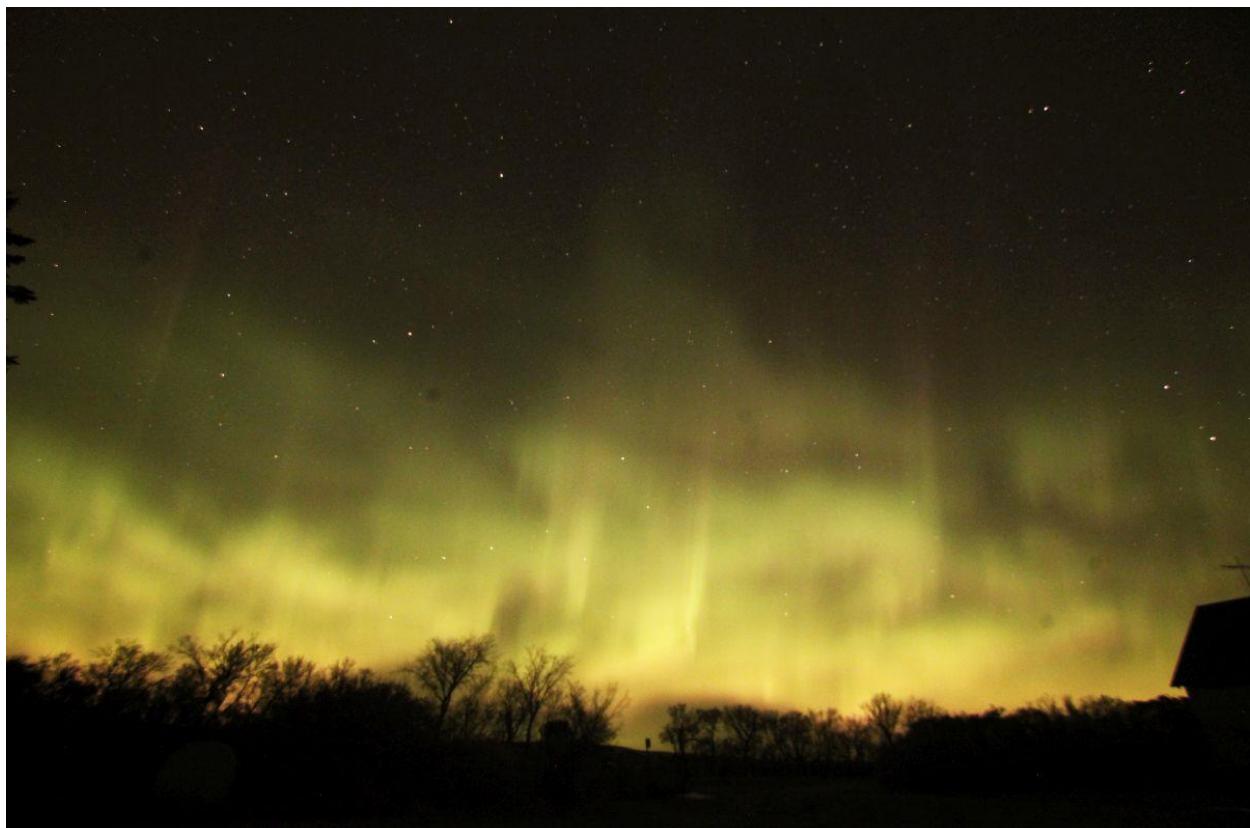
Time (UT)				NOVEMBER EVENTS	Jupiter's Satellites	
	d	h	m		West	East
Tue.	1	6	37	<b>first quarter</b>		
		21		Saturn 4° N of Moon		
Wed.	2	23	12	Algol at minimum		
Thu.	3	0	22	<b>Double shadow transit on Jupiter</b>		
		8		<b>Juno 1.0° N of Moon, occultation†</b>		
Fri.	4	8		Neptune 3° N of Moon		
		20		<b>Jupiter 2° N of Moon</b>		
Sat.	5	18		S. Taurid meteors peak		
		20	01	Algol at minimum		
Sun.	6			<b>DAYLIGHT SAVING TIME ENDS</b>		
Mon.	7					
Tue.	8	11	02	<b>full Moon</b>		
		13		<b>Total Lunar Eclipse (p. 132)</b>		
		16	50	<b>Uranus 0.8° S of Moon, occultation‡</b>		
		17		Algol at minimum		
Wed.	9			Mercury in superior conjunction		
		8		Mercury at descending node		
				<b>Uranus at opposition</b>		
Thu.	10					
Fri.	11	13	39	Algol at minimum		
		14		<b>Mars 2° S of Moon</b>		
Sat.	12	18		N. Taurid meteors peak		
Sun.	13					
Mon.	14	0		<b>Pollux 1.7° N of Moon</b>		
		7		Moon at apogee (404 921 km)		
		10	28	Algol at minimum		
Tue.	15					
Wed.	16	13	27	<b>last quarter</b>		
Thu.	17	7	17	Algol at minimum		
Fri.	18	0		<b>Leonid meteors peak</b>		
Sat.	19			<b>Mercury at aphelion</b>		
Sun.	20	4	06	Algol at minimum		
Mon.	21			Venus at descending node		
Tue.	22					
Wed.	23	0	55	Algol at minimum		
		22	57	<b>new Moon (lunation 1236)</b>		
Thu.	24	13		Jupiter stationary		
		13		Pallas stationary		
Fri.	25	21	44	Algol at minimum		
Sat.	26	2		Moon at perigee (362 826 km)		
Sun.	27					
Mon.	28	18	33	Algol at minimum		
Tue.	29	5		Saturn 4° N of Moon		
Wed.	30	14	36	<b>first quarter</b>		







*Milky Way over the Red Canyon Arch (near Bryce Canyon National Park, Utah) in Sept 2022.  
Canon 6D Mk2, Sigma 14mm lens, F2.8, ISO 5000, 15 seconds. By Tammy Vallee*



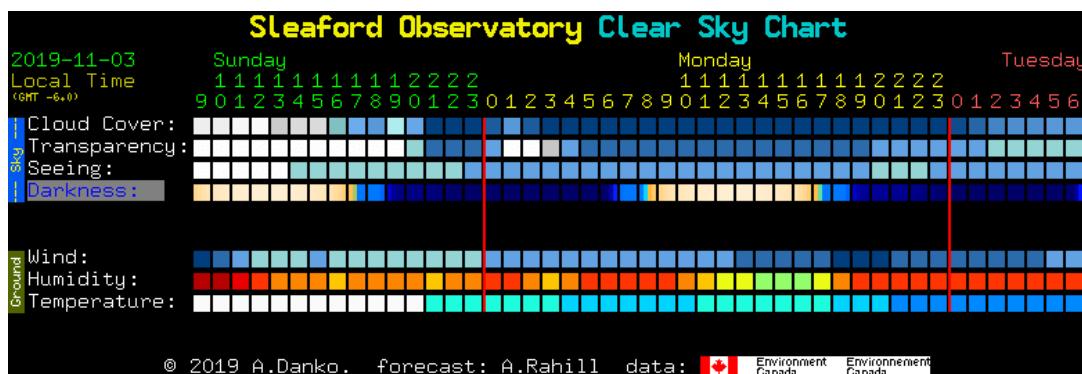
*Aurora on October 29 at 12:26 am, with modified Canon T3i, 10mm lens, 5 second exposure, ISO 3200.  
Taken by Tenho Tuomi*

# 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)

## SERVICE MEDALS FINALLY ARRIVED

Rick Huziak



The beautifully cast and engraved bronze Service medals have finally arrived for Merlyn Melby, Tenho Tuomi and Barb Wright. We managed to get Barb's medal to her since she was in Saskatoon at the end of October visiting family and friends. Although the citation was for Barb's work at the Saskatoon Centre, the medal is inscribed "Barbara Wright, Victoria Centre." (Barb transferred to the Victoria Centre a few years ago after her retirement). And now, Barb has moved to Calgary. No matter what, we are still very proud of her. You can read Barb's citation in *Saskatoon Skies*, May 2023, page 16. Merlyn's and Tenho's medals remain to be presented in person.

## DARK SKIES AT THE CREEK

Rick Huziak

This summer, the Meewasin Valley Authority opened up their programming to the public with our first program for the May lunar eclipse (see *Saskatoon Skies*, June 2022). *Dark Skies at the Creek* was our next program for the MVA. The event ran from 6 pm until 9 pm, with about 60 people of all ages coming. At 6:30, I gave a talk: *An Introduction to Astronomy*, describing observing with eyes, binoculars, and telescopes, then devolved into the new discoveries of the James Webb Space Telescope. The rest of the evening had a guided night-walk by interpreter Jamie Harder and our portion, the public star-night. With the sky clearing nicely and a great temperature for this time of year of +9 degrees C, we were able to show Saturn, Jupiter, some star clusters and nebulae and at the end of the night, the blob of Mars as it was just rising about the east horizon. I was also surprised by the number of satellites visible over the evening – at least three dozen. Maybe this was the start of the StarLink era!

Thank you to Brent Gratias, Rob Waldron, and non-member/astrophotographer Tyler, who all helped show everyone the wonders of the sky. (As always, it would have been nice to see more members participate in our outreach programming and we also still need an Activities Coordinator for upcoming events). The event was set up by MVA interpreter Samantha Cowan.

## 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

## 2023 RASC CALENDARS



2023 calendars have arrived. If you want a 2023 RASC Calendar, we have a limited supply available for \$20 each. **Call Donna-Lee at 780-913-2785.** They can be picked up at her house in Saskatoon, or if you live away from Saskatoon, we can arrange to mail them out to you at a small additional cost.

# STAR DAY IN NEUANLAGE - OCTOBER 17TH

Rick Huziak & Patricia Gakis



On occasion we get requests for programs a little further afoot. Neuanlage is a hamlet about 40 kilometres out on the way to Prince Albert, and we were invited there to give a presentation to the Classical Conversations International School, led by Ciska Du toit. This was a Monday morning program, running from 10 am to noon. We had a great set-up in the Grace Mennonite Church gymnasium in the middle of the hamlet. Rick gave a talk entitled “A New View of the Solar System” and passed around meteorites for the kids to hold. After the talk, we set up our filtered white light telescopes to view sunspots. Although there were only two tiny groups of spots near the edge of the sun. Everyone still got a good look on a warm, clear morning. We had about 60 kids from ages 4 to about 14 and about a dozen accompanying parents. They were all quite enthusiastic and asked great questions. As an aside, one of the parents attending coincidentally has just rented a telescope and had Ike Thiessen come out and do an instructional session a few nights before.

# NOVEMBER COUNCIL ELECTIONS

Rick Huziak & Patricia Gakis

We had a decent set of volunteers and nominees for the Centre Executive at the October Annual General Meeting. However, we failed to elect a President, Speaker Coordinator and Activities Coordinator. We hope than members will step up and be elected to those positions at the November meeting, since we do have the business of the Centre to get to, including confirmation of continuing (or new) committees and approval of their budgets for the year.

## **Consequences of a Non-functioning Executive:**

### **RASC National Bylaw #1,**

**Para. 7.3. The business of each Centre shall be administered by a governing body, which will consist of at least a President, a Secretary and a Treasurer.**

**Para. 7.1.8: The Board [of the National RASC] may, by special resolutions(s), withdraw recognition of a Centre if the continued recognition of such Centre is not in the best interests of the Society.** A Centre whose withdrawing of association is proposed has the right to receive a minimum of 30 days' notice of the meeting(s) at which withdrawal of association shall be proposed and of the intention to propose such withdrawal of association, and to make representations at the meeting at which the votes are held. ...

**Corporations Branch (Sask)** – requires an interim functional executive or acting President to refile for Incorporation continuance.

**Lack of a Speaker Coordinator** – no programming (on-line or in-person) at meetings, though business meetings continue.

**Lack of Outreach Coordinator** – no public outreach, limiting income from these events, and limited recruiting of new membership.

# LIGHT POLLUTION - NOVEMBER 2022

Rick Huziak

**Brightening Skies at Sleaford** – At the October 1<sup>st</sup> Sleaford Open House I noticed a new glow in the east-northeast sky that wasn't there a while ago. After the open house had concluded, I drove out to see what the light source might be. Well ... it is an expanded farmyard at the corner of Colonsay Road and Patience Lake Road, two kilometres away

from Sleaford. Unfortunately, the farmer has installed six non-shielded barrel yard lights, likely with the intent of protecting his yard from overnight vandalism. The effect is to brighten the sky at Sleaford by a little bit.

We've often talked about protecting Sleaford from light intrusion and some effort has been made over the years. For example, two decades ago, an Image Cable microwave tower was planned only a few kilometres from the site, but once they recognized that the tower would have a negative effect on the observatory, Image kindly moved the tower site further eastward. However, since then not much has been done to preserve Sleaford darkness, outside of lobbying Saskatoon to adopt their Dark-sky Policy.

It is probably time to have a discussion with the RM of Colonsay and talk about a lighting restriction bylaw that might restrict non-shielded lighting from being erected within a certain distance of the observatory. Of course, such a bylaw is not always easy to get passed, especially if poor neighbours want to argue that even light scattered into the sky is necessary for their safety and security.

A task like this is something we should be considering, because if we ignore the sky around our observatory, we will eventually lose it. That task would likely require the cooperation of both the RASC and the University of Saskatchewan, who'd likely want to also preserve the sky for their remote observatory programs, a discussion initiated through the Sleaford Joint Site Management Committee.

**Is the Sky Just Brightening?** – Observing from my backyard in Saskatoon is not what it used to be. Back when I was more of an active variable star observer, sessions in my backyard with my 10" scope would result in observations of stars below 14<sup>th</sup> magnitude on a regular basis. That was 15 years ago, and several things have changed: I have gotten older, the sky no longer ever seems to be dark blue during daytime (indicating the atmosphere is not as clear), there are far more jet contrails at dusk (with almost always early evening cirrus) and lighting has changed from high pressure sodium (orange) light to blue LEDs, the back, thankfully, to light yellow (3000K) shielded LEDs. But now, I am lucky if I can see to 12.5 magnitude – an almost 5-times reduction in “darkness”. Twenty-five years ago, an astrophotographer from Calgary mentioned to me that he was putting his astrophotography equipment away since the sky was nowhere near as transparent as before. A recent scientific study also indicated that the sky is now 10% brighter since 1957 from the launch of thousands of satellites, and this is just going to get worse with 100,000 new Internet satellites being launched over the next 10 year.

So ... what are the real contributing factors? Is the sky truly getting thicker, or has the sky just gotten that much brighter over the last 25 years ago. With the new *Jevons Paradox* – people are using more LED lighting because they are cheaper – and light pollution is thus increasing worldwide at 2.2% per year. But which of these factors are the major contributors? Maybe they all are! I'd like to hear your opinions, stories, and suppositions.



Aurora panorama taken by Tara Magee, March 2022

Unfiltered  
by Tara Magee

## 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)

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
Brent Gratias	96
Marcel Müller-Goldkuhle	94
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, B. Gratias*

Wayne Schlakohl	55
Jim Goodridge	35

#### **ISABEL WILLIAMSON LUNAR OBSERVING CERTIFICATE**

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

*T. Tuomi, N. Jensen*

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

*T. Yaworski*

Brent Gratias	31
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#### **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

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

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

Tenho Tuomi	150
Darrell Chatfield	70

Messier, Finest NGC, and David Levy's Deep-Sky lists in the *Observer's Handbook*.

The Explore the Universe list is available here <http://www.rasc.ca/explore-universe>

Messier and Finest NGC lists, charts and logbooks: <http://www.rasc.ca/observing>

Herschel 400 List: <http://www.astroloegue.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>