

Saskatoon Skies

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

Volume 56, Number 10

November 2025



Royal Astronomical Society of Canada
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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: \$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
- borrow the Centre's projector to give astronomy outreach presentations - contact Les Dickson at astrochem@sasktel.net
- rent the Centre's Telescopes <https://saskatoon.rasc.ca/telescopes.html>
- use of the Centre library
- Journal of the RASC (electronic format)

SASKATOON CENTRE'S MAIN OFFICERS:

President - John Takala

Vice-President - Nick Larsen

Secretary - Lorie Tedford

Treasurer - OPEN (Les Dickson to fill in until filled)

National Council Rep - Joelle Sheard-Patrick

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.

NEWSLETTER & U OF S OBSERVATORY INFO

Newsletter Editor - Colin Chatfield

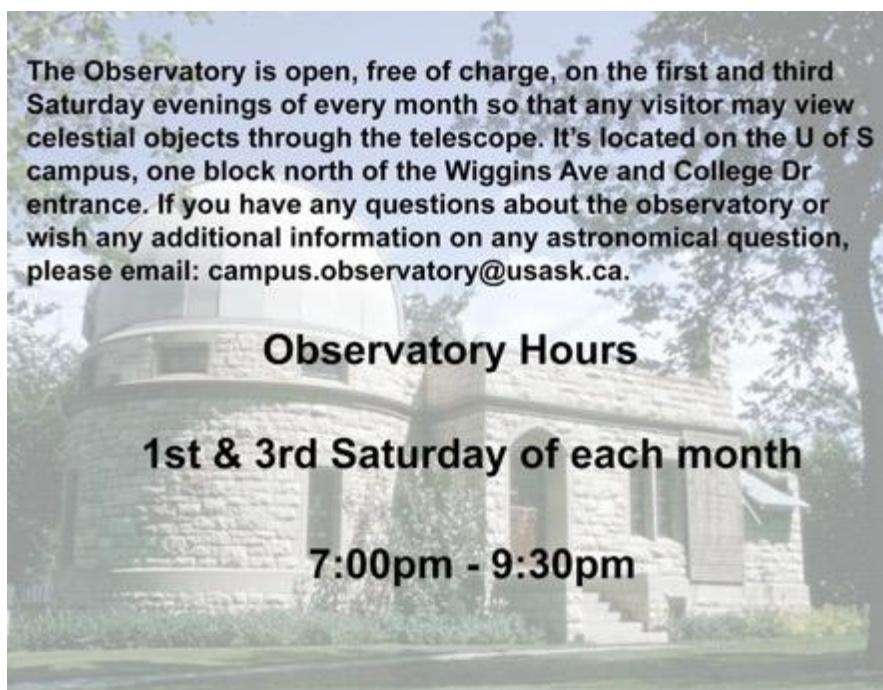
Copy & Collate - Les & Ellen Dickson

Labels & Temps - Mark de Jong

Web Posting/Content Editor - Tenho Tuomi/Andrew Kostiuk/Brent Burlingham

Saskatoon Skies is published monthly by the Saskatoon Centre of the RASC. Distribution is approximately 80 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 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 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/community/observatory.php>

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

RASC CALENDAR OF EVENTS & MEETING INFO

| | | |
|---------------|--|------------------|
| Nov 17 | RASC Saskatoon Centre General Meeting | Brent Burlingham |
| Nov 22 | Observer's Group - Sleaford Observatory | Nick Larsen |

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 17th, 2025, at 8:00PM (Executive meeting at 7:00pm)
Webinar (info below)

***Please note:** the meeting will be at the U of S Observatory at 108 Wiggins Ave (on the U of S Campus)*

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 -**
“Light, the Universe, and (Almost) Everything” - Les Dickson

Info about talk below

BOOKS AND EQUIPMENT FOR SALE

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

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

Please email me if you want to see any items - novachat@sasktel.net. Darrell Chatfield

- 2 - 1.25" rack and pinion focusers for refractor type telescopes. Brand new. Never used. Inset diameter is 57mm. Heavy duty type with metal knurled knobs. All have boxes. \$20.00 each.

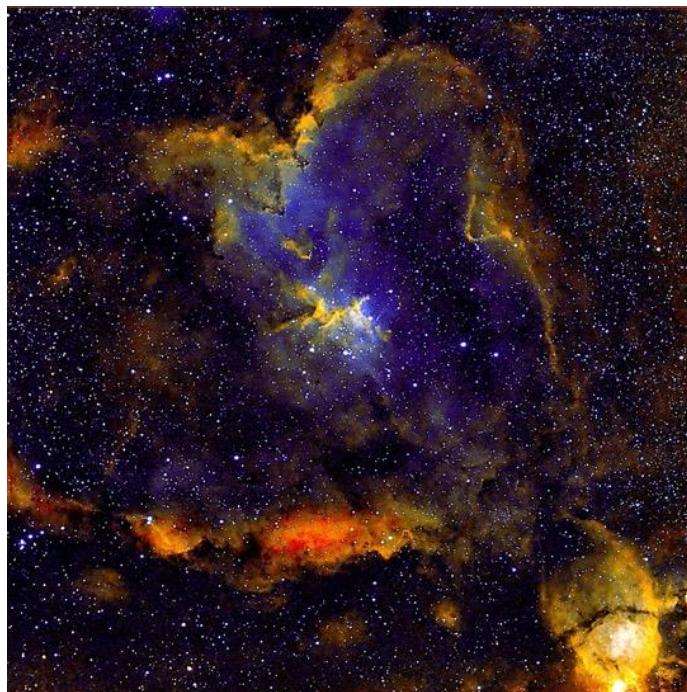
- Original Celestron orange tube C5" scope with tangent arm. Fork arms. SCOPE ONLY. No tripod or wedge. 5 x 30 finder, 1.25" visual back, diagonal, eyepiece, lens cap, metal case. Was used as a spotter scope. Not a mark on the tube. Clean looking. \$250.00

| | | |
|---|--|----------------------|
| 1 | 1.25" eyepiece extender - 3" long | \$20.00 |
| 1 | 1.25" Celestron off axis guider c/w 12.5mm ep. Can be illuminated. | New. \$45.00 |
| 1 | Celestron 1.25" reticle. Can be illuminated | \$20.00 |
| 1 | 3.5" long 1.25" tele-extender | \$20.00 |
| 3 | 1.25" visual backs new | \$10.00 each |
| 1 | 1.25" to 0.965" visual back | \$10.00 |
| 1 | Camera to visual back adapter | Lightly used \$10.00 |
| 1 | Threaded visual back to 16mm male threads camera adapter | \$10.00 |

- Original orange tube Celestron finder. 10 x 40mm. 304mm (12") long. Comes with bracket meant for a C8" telescope but would fit other scopes. Not a mark on these items. \$65.00

- 6" primary mirror in a 3-point adjustable mirror cell. Some mirror spots. Nice condition. \$85.00 (came from the following tube).

- 7" diameter x 48" long aluminum Newtonian style tube. Ivory exterior with blackened interior. Also has a focuser. Finder bracket supplied as is. There may be some packing tape on the outside that needs to be removed. \$75.00



"The Heart and Soul nebula from my back yard in the city." Taken by Jeff Swick

NOVEMBER NIGHT SKY EVENTS AND INFO

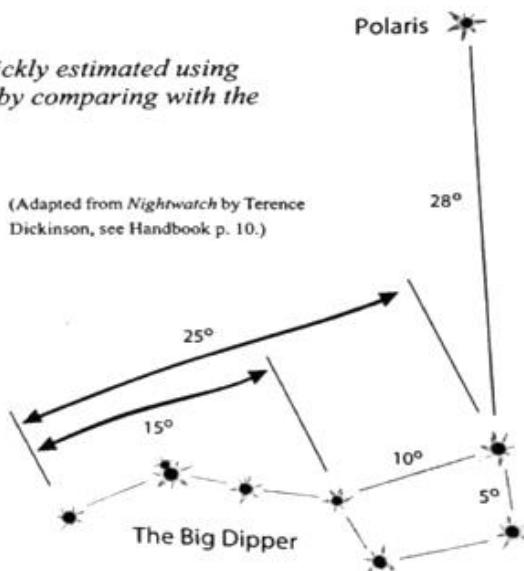
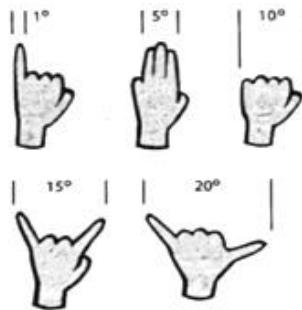
Images on the next few pages used, with permission, from the 2024/25 Observer's Handbook. It can be obtained by joining the RASC here <http://rasc.ca/join> or ordered from <https://secure.rasc.ca/store>.



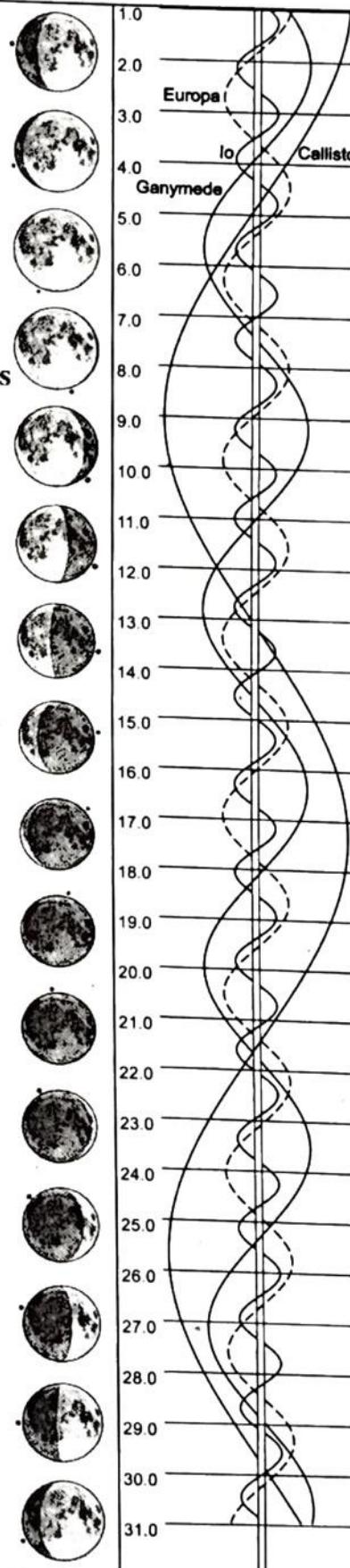
HANDY SKY MEASURES

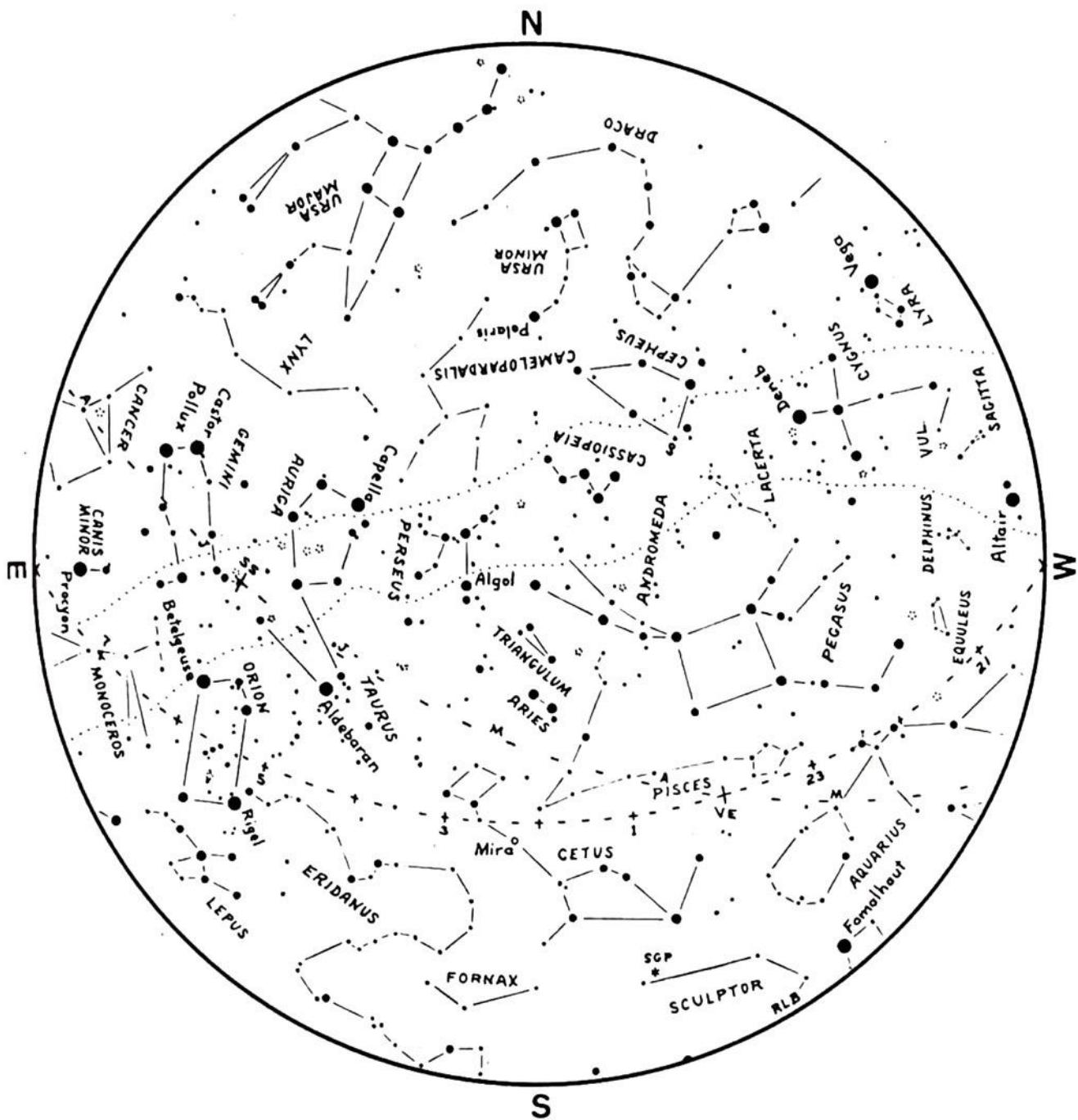
Angular measure in the sky can be quickly estimated using the fingers of an outstretched arm, or by comparing with the star separations in the Big Dipper.

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



| Time (UT) | | | NOVEMBER EVENTS | | | Jupiter's Satellites | | |
|-----------|----|-------|--|--|-------------|----------------------|------|--|
| | d | h m | | | | West | East | |
| Sat. | 1 | 15 54 | Double Shadows on Jupiter | | | | | |
| | | 17 46 | Moon at ascending node | | | | | |
| Sun. | 2 | 6 24 | DAYLIGHT SAVING TIME ENDS | | | | | |
| | | 11 | Algol at minimum | | | | | |
| | | 17 | Saturn 4° S of Moon | | | | | |
| Mon. | 3 | | Neptune 3° S of Moon | | | | | |
| Tue. | 4 | | | | | | | |
| Wed. | 5 | 3 13 | Algol at minimum | | | | | |
| | | 5 12 | Double Shadows on Jupiter | | | | | |
| | | 13 | S Taurid meteors peak | | | | | |
| | | 13 19 | full Moon (largest in 2025) | | | | | |
| | | 22 | Moon at perigee (356833 km) | | Large tides | | | |
| Thu. | 6 | 16 | Moon 0.8° N of Pleiades (M45) | | | | | |
| Fri. | 7 | | | | | | | |
| Sat. | 8 | 0 02 | Algol at minimum | | | | | |
| Sun. | 9 | 23 | Mercury stationary | | | | | |
| Mon. | 10 | 8 | Jupiter 4° S of Moon | | | | | |
| | | 20 51 | Algol at minimum | | | | | |
| Tue. | 11 | 6 | Moon 1.7° N of Beehive (M44) | | | | | |
| | | 20 | Jupiter stationary | | | | | |
| Wed. | 12 | 5 28 | last quarter | | | | | |
| | | 12 | N Taurid meteors peak | | | | | |
| | | 19 | Mercury 1.3° S of Mars | | | | | |
| Thu. | 13 | 0 | Regulus 1.0° S of Moon, occultation¹ | | | | | |
| | | 17 40 | Algol at minimum | | | | | |
| Fri. | 14 | 6 38 | Moon at descending node | | | | | |
| Sat. | 15 | | | | | | | |
| Sun. | 16 | 14 29 | Algol at minimum | | | | | |
| Mon. | 17 | 11 | Spica 1.2° N of Moon, occultation² | | | | | |
| | | 18 | Leonid meteors peak | | | | | |
| Tue. | 18 | | Mercury at ascending node | | | | | |
| Wed. | 19 | 11 18 | Algol at minimum | | | | | |
| Thu. | 20 | 3 | Moon at apogee (406691 km) | | | | | |
| | | 6 47 | new Moon (lunation 1273) | | | | | |
| | | 9 | Mercury in inferior conjunction | | | | | |
| Fri. | 21 | 1 33 | Double Shadows on Jupiter | | | | | |
| | | 12 | Uranus at opposition | | | | | |
| Sat. | 22 | 8 07 | Algol at minimum | | | | | |
| Sun. | 23 | | Mercury at perihelion | | | | | |
| Mon. | 24 | | | | | | | |
| Tue. | 25 | 4 56 | Algol at minimum | | | | | |
| | | 14 | Pluto 0.4° S of Moon, occultation³ | | | | | |
| Wed. | 26 | | | | | | | |
| Thu. | 27 | 23 | Ceres stationary | | | | | |
| Fri. | 28 | 1 45 | Algol at minimum | | | | | |
| | | 6 59 | first quarter | | | | | |
| | | 21 33 | Moon at ascending node | | | | | |
| Sat. | 29 | 1 | Saturn stationary | | | | | |
| | | 15 | Mercury stationary | | | | | |
| | | 19 | Saturn 4° S of Moon | | | | | |
| Sun. | 30 | 2 | Neptune 3° S of Moon | | | | | |
| | | 22 34 | Algol at minimum | | | | | |





REIMBURSEMENT FOR CENTRE EXPENSES

The Centre has a reimbursement procedure on submission of expense claims. A writeable pdf claim form can be found on the Centre webpage under the Executive tab. The expense form **must** be submitted *along with original receipts* to the Treasurer within 30 days of the transaction. All expenditures must be preapproved by the Executive or be within allocated budgets.

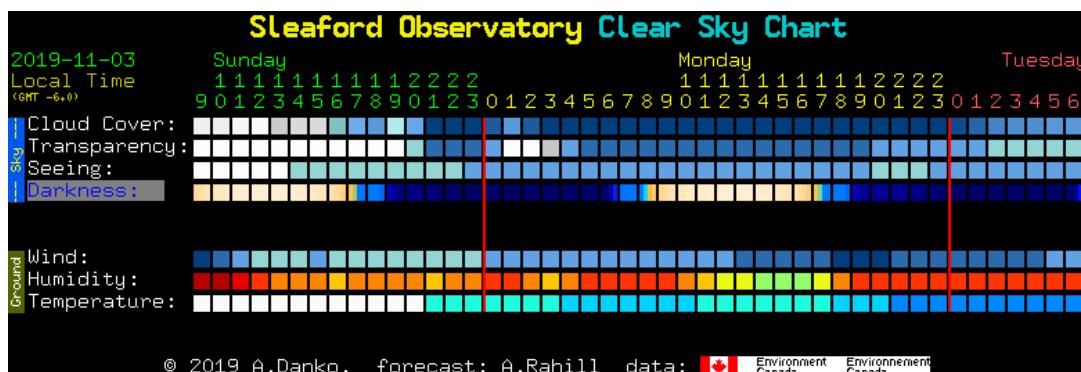
Please contact the Treasurer with any inquiries.

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



Saskatchewan Light Pollution Abatement Committee -

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



www.darksky.org

TELESCOPES FOR RENT

Jeff Swick

Saskatoon Centre has made its telescopes available for rent to RASC members on a monthly basis. We have three Sky-Watcher 8 inch Dobsonian telescopes, each with a kit of eyepieces and Antares 8x50 right angle finder scopes. Also we have one Telrad Reflex Sight.

Visit the website for more info -

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





Latest picture of comet C/2025 A6 (Lemmon) taken October 25 through an 800mm focal length telescope (80mm telescope with 2x teleconverter). The camera was rotated to the right to get more of the tail with north on right. Taken by Tenho Tuomi.

MINUTES OF OCTOBER MEETINGS

Lorie Tedford

Minutes of the Monthly Executive Meeting of the RASC Saskatoon Centre Monday, Oct 20th, 2025 - 7:00 pm Hybrid: Online & In-person: U of S Observatory

Attending: Brent Burlingham, Lorie Tedford, Les Dickson, Joelle Sheard-Patrick, Darrell Chatfield, John Takala, Nick Larsen, Colin Chatfield, James Wood, Jeff Swick, Tenho Tuomi

- 1. Call to order** 7:00 pm - Brent Burlingham (President and Chair)
- 2. Approval of the Executive meeting minutes for September 2025** as printed in the October newsletter. Moved by Les Dickson, seconded by John Takala; carried.
- 3. Call for additional announcements/items to add to the agenda.**
 - 3.1 Financial Report**
 - 3.2 Fundraising**
 - 3.3 Membership Coordinator Position**
- 4. Announcements from the Chair** - None to present
- 5. Old Business - Reports from the Executive Council**
 - 5.1 President's Report - Brent Burlingham**
 - Thanks to Tim Yaworski and centre members who assisted at the Observe the Moon event on October 4th at W.W Ashley Park.

5.2 Acting Treasurer - Les Dickson

- Motion by Les Dickson to have the profit of sales of the telescope equipment earmarked for future telescope upgrades and accessories for the rental program. Seconded by Nick Larsen, carried.
- Financial report as of October 20th is as follows:

Income (not including SSSP Account)

| | |
|--------------------|--------------------|
| Membership | \$2,246.28 |
| Donations | \$135.00 |
| Coffee Fund | \$49.95 |
| SSSP 2023 | \$2,625.00 |
| Telescope Rental | \$365.00 |
| Sales of Equipment | \$7,600.00 |
| TOTAL | \$13,021.23 |

Expenses (not including SSSP Account)

| | |
|--|-------------------|
| Public Education | \$151.46 |
| Insurance | \$2,071.34 |
| Repairs and Maintenance (Sleaford) | \$422.61 |
| Office and Admin | \$227.74 |
| Newsletter printing and mailing | \$69.85 |
| Misc. (includes donation to Petriew Cairn) | \$1,530.53 |
| TOTAL | \$4,473.53 |

- a Transfer in from SSSP account for our portion of profit
- b \$4,500 from sale of C16, \$3,100 from sale of donated equipment

SSSP 2025

- Estimated profit (income - expenses - donations): \$2,885
- Profit statement for SSSP 2024 in preparation

Funds in Credit Union Accounts

| Account | Start Oct 2024 | End Sep 2025 |
|--------------|----------------|--------------|
| General | \$21,618.22 | \$30,165.92 |
| SSSP | \$14,698.11 | \$19,308.38 |
| Term Deposit | \$2,310.36 | \$2,379.67 |

1. National Council Rep - Joelle Sheard-Patrick

- Award nominations need to be in by December 31st. Need two members to sign off a nomination.

2. Activities Coordinator - Joelle Sheard-Patrick

- November 1st at Beaver Creek is a dark sky event with Tim Yaworski. If interested in helping, contact Tim. Set up is for 6 pm.
- For outreach activities, going to focus on Tim's events with Meewasin due to community involvement and manpower of the club.
- Possibility of hosting more events in the upcoming year for members.

3. Sleaford Update -Darrell Chatfield

- The grass has been cut. The weeds have been pulled and sprayed.
- Attempted to get the snowblower to work but couldn't get it to work.
- U of S. needs to contact the RM to fill out forms.
- Need a fire extinguisher for the warm up shelter. Motion made to give Darrell a budget of \$500 per year for upkeep and maintenance for Sleaford. Seconded by Joelle Sheard-Patrick, carried.

6. Old Business

6.1 Review and update the Centre executive and support positions in order to prepare for the elections at the following AGM. (See attached list of positions and members who have indicated and willingness to stand).

7. New Business

7.1 RASC Saskatoon Centre Property and Liability Insurance

- The property and liability insurance in the amount of \$1,693.88 was due and a cheque for that amount was submitted to Westland Insurance. Needs executive approval and motion moved.
- Motion to acknowledge the payment to Westland Insurance made by Les Dickson to approve the payment of \$1,693.88 to Westland Insurance. Seconded by Nick Larson, carried.

7.2 Fundraising

- Discussed the possibility of participating in giving Tuesday on December 2nd.
- The event would take place over social media with hopes of raising money for a specific project. Possibly a new telescope that members could use? If there are any ideas, bring to the next meeting.
- It would entail a series of emails being sent with information regarding what the donations would be contributing to.

7.3 Membership Coordinator

- **Motion** made by Nick Larsen to remove the position of membership coordinator as the duties have been allocated to other positions and it is no longer necessary.
Seconded by Darrell Chatfield, **carried**.

8. Motion to adjourn by Les Dickson; **carried**. 7:59 PM.

Minutes of the Monthly General Meeting of the RASC Saskatoon Center Monday, Oct 20th, 2025 - 8:00 pm Hybrid: Online & In-person: U of S Observatory

Minutes taken and prepared by Lorie Tedford.

- 1. Sharing/Networking Time** - 8:00-8:15 pm - all members.
- 2. Call to Order** - 8:16pm - Brent Burlingham (President and Chair)
- 3. Call for additional announcements/items to add to the agenda.**
 - 3.1. Financial Report** - see Executive Minutes for Report
 - 3.2. Christmas Party** - Lorie Tedford to plan Christmas Party
- 4. Call out to new members/guests:** None
- 5. Adoption of the September General meeting minutes** as printed in the October newsletter. **Moved** by Jeff Swick, **seconded** by Lisa Caldwell, **carried**.
- 6. Executive Meeting Summary** - Brent Burlingham
 - See Executive Meeting Minutes
- 7. Resignation of Outgoing Directors and Appointment of New Directors**
 - 7.1. Resignation of Outgoing Directors**
 - 7.2. Appointment of Incoming Directors**
- 8. Election of Officers**
 - **President:** John Takala
 - **Vice President:** Nick Larsen
 - **National Council Rep.:** Joelle Sheard-Patrick
 - **Secretary:** Lorie Tedford
 - **Treasurer:** OPEN

Support Positions

- **Past President:** Brent Burlingham

- **Librarian/Archivist:** Darrell Chatfield
- **Activities Coordinator:** Joelle Sheard-Patrick
- **Newsletter Editor:** Colin Chatfield
- **Web Master:** Andrew Kostiuk
- **Web Content Editor:** Tenho Tuomi
- **Sleaford Maintenance Coordinator:** Darrell Chatfield
- **Observers/Imaging Group Coordinator:** OPEN
- **Speaker Coordinator:** Jeff Swick
- **Telescope Rental Coordinator:** OPEN
- **Photographers:** George Charpentier, Colin Chatfield
- **Social Media Coordinator:** Colin Chatfield
- **Observing Certificate Coordinator:** Darrell Chatfield
- **Fundraising Coordinator:** Verity Moore-Wright

Board of Directors (contacted, waiting a response).

- **George Charpentier**
- **Mark De Jong**
- **Norma Jensen**
- **Yannis Pahatourogloou**

Saskatchewan Summer Star Party

- **Chair:** OPEN
- Rick Huziak
- **3 Support Positions** - Lorie Tedford, Nick Larsen, Verity Moore-Wright
- George Charpentier
- Andrew Kostiuk
- Greg Fusick
- Joelle Sheard-Patrick

Sleaford Joint Committee

- Yannis Pahatourogloou (RASC)
- Darrell Chatfield (RASC)
- Daryl Janzen (Usask)
- TBD (Usask)

Constitution Committee

- Les Dickson

9. Program

9.1. “Astronomy Rig Upgrades and Improvements” presented by Jeff Swick

10. Call to adjourn - Moved by Nick Larson, **seconded** by Lisa Caldwell; **carried.**

NOVEMBER SPEAKER

Les Dickson

How do we know anything about the objects in the sky other than their position and movements? By studying the light we receive from them. Spectroscopy is the field of study that measures and interprets the properties of light and what it tells us about the composition and structure of matter. This presentation will be a once-over-lightly introduction to spectroscopy as it pertains to astronomy and how it is relevant to amateur astronomers.



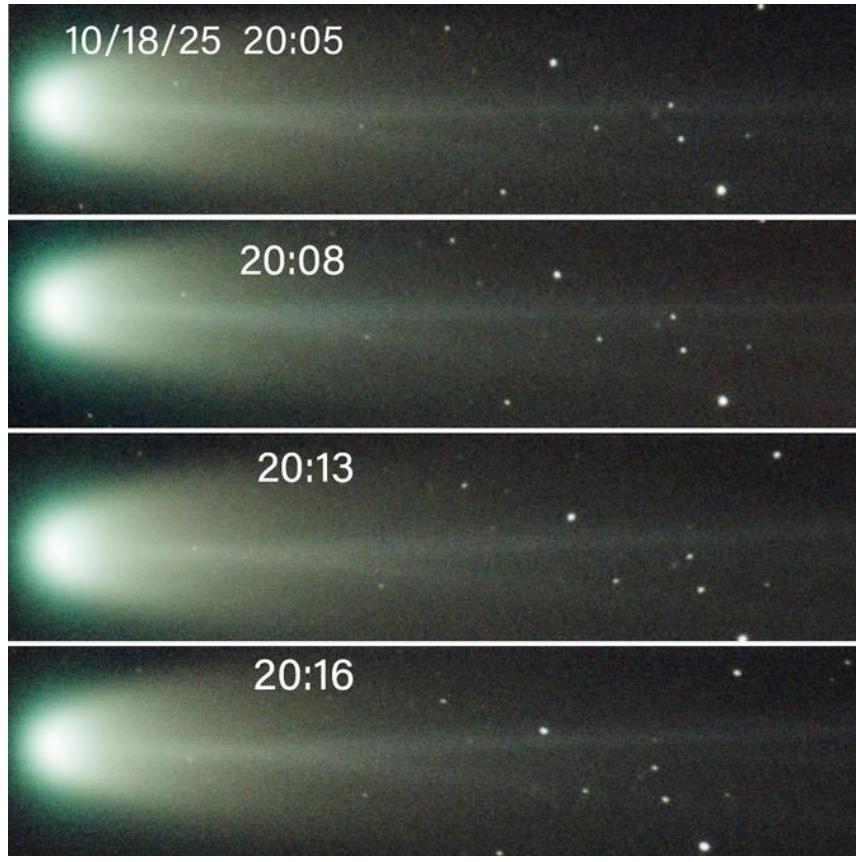
Squid nebula (Ou4) from the 2024 season. Taken from Bortle 8 inner city back yard. 30 hours of Oiii acquisition and a single hour of Ha data for the Bat (Sh2-129). This faint target is super challenging even from darker skies. Shot with Sharpstar 94 EDPH Triplet, ASI 533 mono camera, ZWO Ha and Oiii 7nm filters, ZWO EFW/EAF/AM3 and ASI AIR mini. Stacked in Siril, processed in PixInsight and Photoshop. Taken by Nick Larsen.



In October Tim Yaworski led a weekend “Introduction to Astrophotography” workshop through the Hawood Inn at Waskesiu in Prince Albert National Park. The two day event included a Friday evening sky tour, a Saturday morning class session and an evening photowalk to try out their new skills.



A three minute exposure (18x10 sec subs) of Comet Lemmon taken with the Seestar S50 smart scope by Tim Yaworski.



Four images of Comet Lemmon taken over 11 minutes to illustrate how far the comet moves across the background stars. Taken with Seestar S50 by Tim Yaworski.

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. 312)
- THE FINEST NGC OBJECTS (p. 316),
- THE DEEP-SKY CHALLENGE OBJECTS (p. 320),
- DEEP-SKY GEMS (p. 322).

See rasc.ca/certificate-programs for details and contact the RASC Observing Committee Chair at 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** and the **Double Stars Observing Certificate** for intermediate to advanced members. In addition, **Astroimaging certificates** are available for those members with a photographic bent. See rasc.ca/astro-imaging-certificate

RASC OBSERVER'S HANDBOOK 2023 – STANDARD EDITION

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 | 104 |
| Marcel Müller-Goldkuhle | 94 |
| Wade Selvig | 75 |
| Wayne Schlapkohl | 43 |
| Ellen Dickson | 34 |
| Graham Hartridge | 9 |

CHATFIELD BINOCULAR CERTIFICATE

Certified at 35 to 40 Objects:

T. Tuomi, R. Huziak

| | |
|---------------|----|
| Jim Goodridge | 12 |
|---------------|----|

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 |
| Brent Burlingham | 97 |

EXPLORE THE UNIVERSE

Certified at 55 to 110

Objects: *T. Tuomi, B. Gratias*

| | |
|------------------|----|
| Wayne Schlapkohl | 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 | 37 |
|---------------|----|

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: <https://www.rasc.ca/certificate-programs>

Herschel 400 List: <http://www.astroloegue.org/al/obsclubs/herschel/hers400.html>

Chatfield Binocular List is at: https://saskatoon.rasc.ca/Chatfield_Binocular_List.pdf

"Isabel Williamson Lunar Observing Program Guide" program details can be found at:

<https://www.rasc.ca/isabel-williamson-lunar-observing-program>