

# Saskatoon Skies

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

Volume 55, Number 06

June 2024



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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
- 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** – Brent Burlingham

**Vice-President** – John Takala

**Secretary** – Lorie Tedford

**Treasurer** – \*vacant\* (Les Dickson interim)

**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](mailto:novachat@sasktel.net).

## NEWSLETTER INFO

**Newsletter Editor** – Colin Chatfield

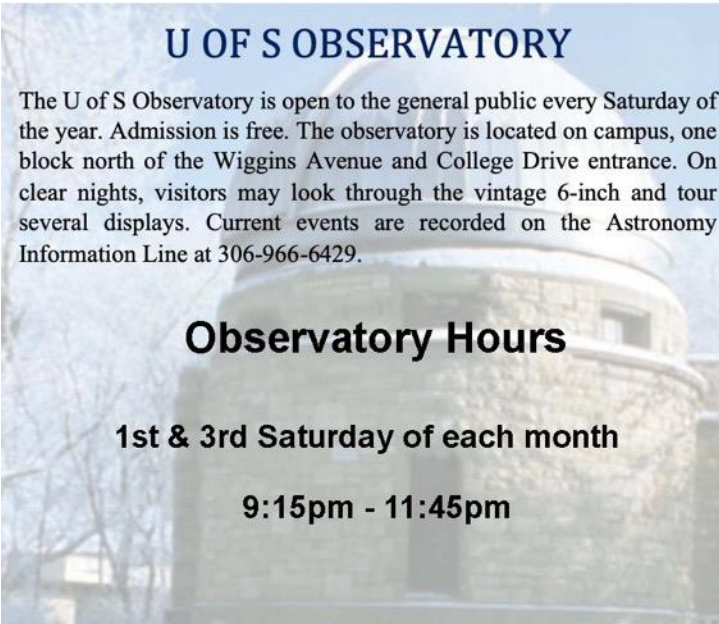
**Copy & Collate** – Les & Ellen Dickson

**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 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.



**U OF S OBSERVATORY**

The U of S Observatory is open to the general public every Saturday of the year. Admission is free. The observatory is located on campus, one block north of the Wiggins Avenue and College Drive entrance. On clear nights, visitors may look through the vintage 6-inch and tour several displays. Current events are recorded on the Astronomy Information Line at 306-966-6429.

**Observatory Hours**

**1st & 3rd Saturday of each month**

**9:15pm - 11:45pm**

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

**June 17**

**RASC Saskatoon Centre General Meeting**

**Brent Burlingham**

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>

## June RASC General Meeting

for all members and guests

**Join us on June 17th, 2024 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 -**

***"What's Up This Month?"*** – Colin Chatfield

**RASC Saskatoon VP John Takala** will share his experiences on his astronomical holiday in the Atacama Desert in Chile

## 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](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 \$15.00
<b>“Observing the Constellations”</b>	1989	J. Sanford	Color charts \$10.00

**\*NOTE: “I will be advertising the astronomy equipment and accessories from the Melby Estate in the next few newsletters. I will also bring a selection of eyepieces, etc. to the next few meetings for your perusal. Some items were never used. All monies go to the Estate. Thank you.”\* Darrell Chatfield**

### FOR SALE FROM THE MELBY ESTATE - A PARTIAL LISTING

Please email me if you want to see any other set - [novachat@sasktel.net](mailto: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

- **Original orange tube C14” scope**. Comes with fork arms, base, wedge, lens cap, 2” visual back, huge 2” diagonal, 5 x 70 finder, swing through locking tripod; 40, 25, 12, and 6mm Kellner eyepieces, 2” – 32mm. Konig eyepiece, 2x barlow, tele extender, hand toggle controller box for slow motion controls, counterweights and 2 rails, power cord, fitted carrying case. All in like new condition. Great looking scope. Hardly used! \$3000.00

- 2 T mount adapters for Miranda cameras \$5.00 each
- 3 1.25" diagonals 2 new in boxes \$15.00 each
- 1 2" – 32mm Erfle eyepiece new in box \$85.00
- 1 2" – 60mm Kelner eyepiece new in box \$85.00
- 1 1.25" Celestron volcano top eyepiece in box \$15.00
- 1 1.25" Celestron volcano top eyepiece in box \$15.00
- 1 1.25" eyepiece extender - 3" long \$20.00
- 1 5x24mm Celestron orange tube finder new in box \$20.00
- 1 1.25" Celestron off axis guider c/w 12.5mm ep. Can be illuminated. New. \$45.00
- 1 Celestron 4x 1.25" eyepiece turret new in box \$65.00
- 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



*Lunar eclipse. Taken by Justin Lukan*



# SASKATCHEWAN SUMMER STAR PARTY 2024

Les Dickson

Saskatchewan Summer Star Party #27 - Noon August 7 to Noon August 11, 2024 SSSP is coming up fast: only two more New Moons until the star party starts on August 7. (I start to panic the Full Moon before.)

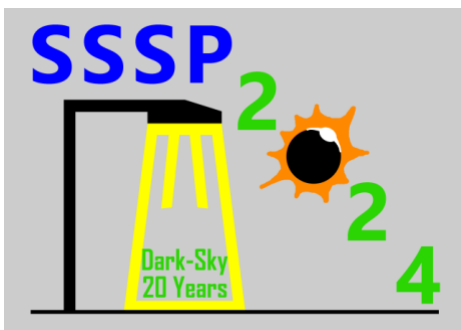
Registration has held steady for the past month. There is usually a big rush shortly before the end of Early Registration on July 6. Those who have not yet registered but want to buy banquet tickets need to register by the end of the early registration date as we must let the Resort know how many places to prepare 30 days before our start date. We are down to 11 campsites on the Meadows Campground and there are 7 open sites in the Dark-sky Campground. The room block set aside at the Resort has now been released. There may still be rooms available for our weekend, but no guarantees.

We have what we think is a great line-up of speakers and presentations. Visit our website for more information and updates.

I wish to remind you all that we are working with the Regina Centre to fundraise for the Comet Petriew Cairn Restoration Project. This commemorative monument stands at the entrance to the Meadows Campground. Donations to that project are done through the Regina Centre of the RASC and tax receipts are available. More information is available on the SSSP 2024 website. Contact the Regina Centre at [info@regina.rasc.ca](mailto:info@regina.rasc.ca) for more information on how to donate.

The planning committee for SSSP includes from Saskatoon: Les Dickson, Ellen Dickson, Rick Huziak, Andrew Kostiuk, George Charpentier, Joelle Sheard-Patrick, Greg Fusick and Brent Harrold, and from Regina: Vance Petriew and Pierre Schierle. We encourage members of our Centre to get involved and volunteer either for planning positions or for on-site help. If you have not attended SSSP before, make this your year!

Our website is at <https://sssp.saskatoon.rasc.ca>. You can contact us at [sssp.sk@sasktel.net](mailto:sssp.sk@sasktel.net) (Rick Huziak) or call Les Dickson at 306-270-9184 (cell) or email him at [astrochem@sasktel.net](mailto:astrochem@sasktel.net).



# SLEAFORD UPDATE

Darrell Chatfield

Here is an update for the Sleaford items I am working on presently.

1. I had 13 original Sleaford keys that I had on hand recut by a locksmith on Friday, and I will be rekeying the locks out at the site shortly.
2. I revised the Sleaford Site Use Manual last week and will have Brent go over it with me, so he can make the changes on the website. I'm going to recommend that we put this manual in a 'members only' area, since there are too many sensitive items within that manual for the general public's viewing.
3. The Sleaford riding mower battery went dead on me last month, so I would recommend a new one, and also buying a battery maintainer at our next meeting. This will give the battery (when not in use) a continual on-demand small charge. The battery should last longer this way.
4. The R.M. of Colonsay has been set up to do the first grass cutting at our site after June 10, when they will have their equipment in use for the season. I have had interest from a few club members in helping with the grass cutting, which is great. More later.

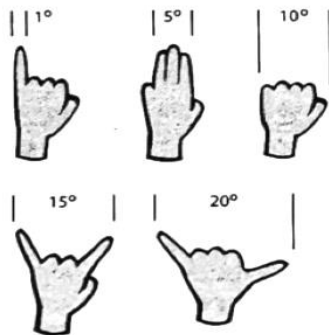
## JUNE NIGHT SKY EVENTS AND INFO

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

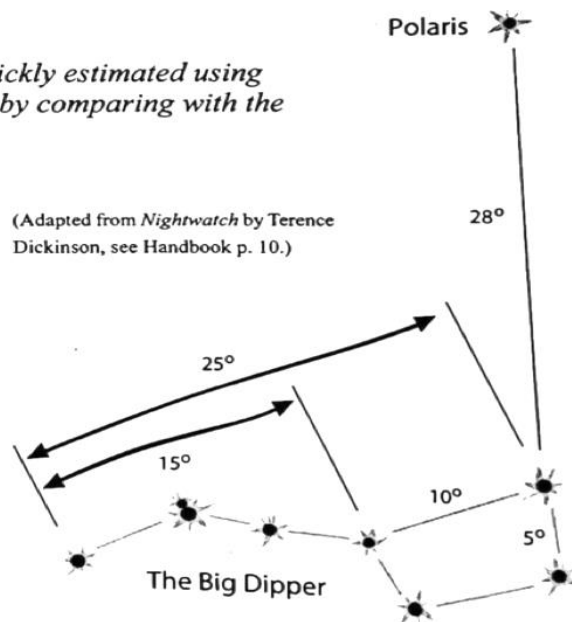


### HANDY SKY MEASURES

*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.)



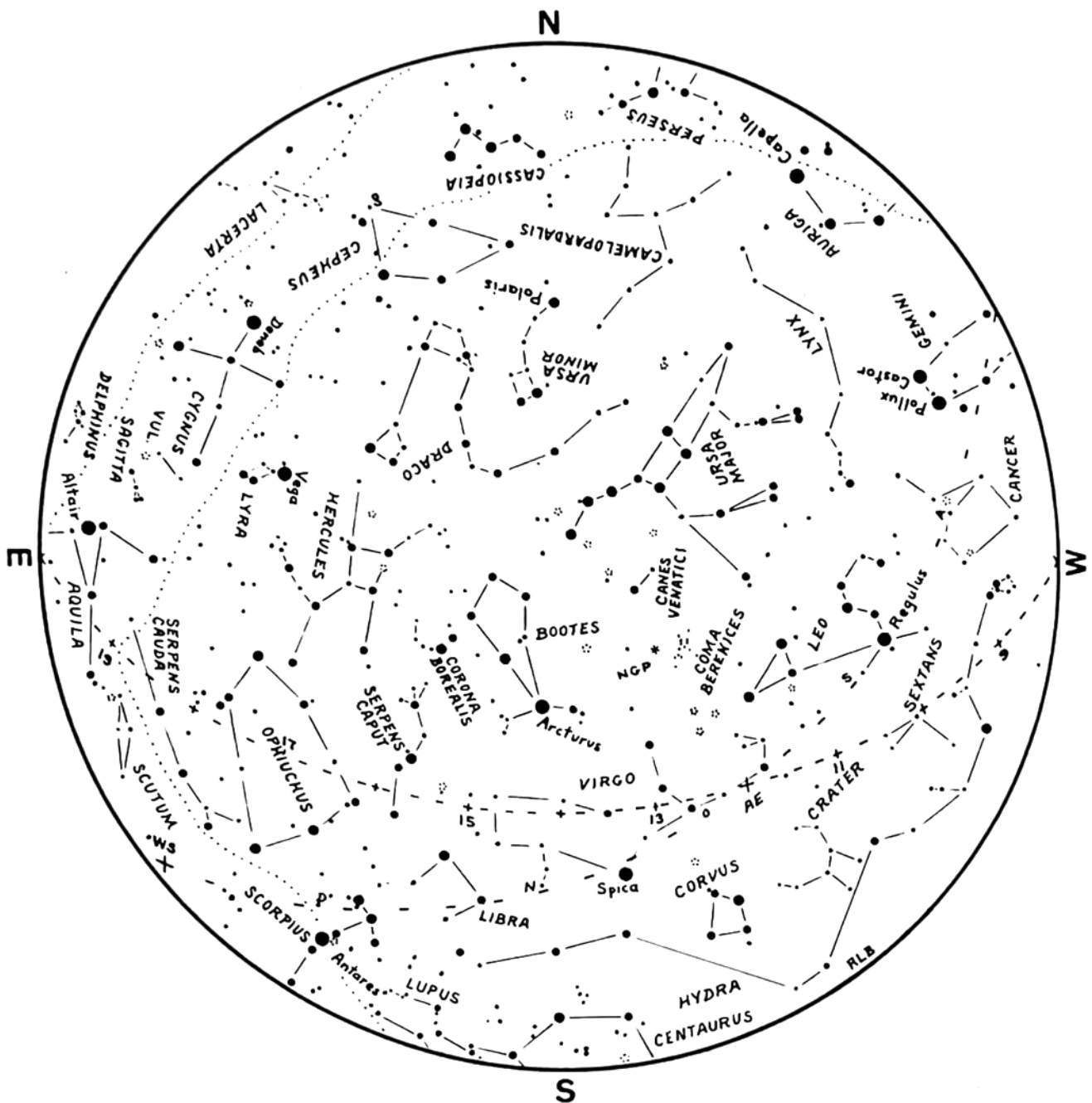
RASC OBSERVER'S HANDBOOK 2024 – STANDARD EDITION



Time (UT)			JUNE EVENTS		Jupiter's Satellites	
	d	h m			West	East
Sat.	1	3	Neptune $0.02^{\circ}$ N of Moon, occultation†		1.0	
		6 40	Algol at minimum			
Sun.	2	3 08	Moon at ascending node		2.0	Europe
		7	Moon at perigee (368 102 km)		3.0	
Mon.	3	0	Mars $2^{\circ}$ S of Moon		4.0	
Tue.	4	3 28	Algol at minimum		5.0	
		10	Mercury $0.1^{\circ}$ S of Jupiter		6.0	
		16	Venus in superior conjunction		7.0	
Wed.	5	1	Uranus $4^{\circ}$ S of Moon		8.0	
		9	Moon $0.4^{\circ}$ S of Pleiades (M45)		9.0	
		14	Jupiter $5^{\circ}$ S of Moon		10.0	
Thu.	6		Venus at ascending node		11.0	
		12 38	new Moon (lunation 1255)		12.0	
Fri.	7	0 17	Algol at minimum		13.0	
Sat.	8		Mercury at ascending node		14.0	
Sun.	9	8	Pollux $1.7^{\circ}$ N of Moon		15.0	
		21 06	Algol at minimum		16.0	
Mon.	10				17.0	
Tue.	11				18.0	
Wed.	12	17 55	Algol at minimum		19.0	
Thu.	13		Mercury at perihelion		20.0	
		9	Juno $0.5^{\circ}$ N of Moon, occultation‡		21.0	
Fri.	14	5 18	first quarter		22.0	
		14	Moon at apogee (404 076 km)		23.0	
		17	Mercury in superior conjunction		24.0	
Sat.	15	14 44	Algol at minimum		25.0	
		20 17	Moon at descending node		26.0	
Sun.	16	18	Spica $1.2^{\circ}$ S of Moon, occultation*		27.0	
Mon.	17				28.0	
Tue.	18	11 32	Algol at minimum		29.0	
Wed.	19				30.0	
Thu.	20	11	Antares $0.3^{\circ}$ S of Moon, occultation§		31.0	
		20 51	Solstice			
Fri.	21	8 21	Algol at minimum			
Sat.	22	1 08	full Moon			
Sun.	23		Mercury at greatest heliocentric lat. N			
		5	Ceres $1.0^{\circ}$ S of Moon, occultation††			
Mon.	24	5 10	Algol at minimum			
Tue.	25					
Wed.	26					
Thu.	27	1 59	Algol at minimum			
		12	Moon at perigee (369 286 km)			
		15	Saturn $0.08^{\circ}$ S of Moon, occultation‡‡			
Fri.	28	9	Neptune $0.3^{\circ}$ S of Moon, occultation**			
		21 53	last quarter			
Sat.	29	4 26	Moon at ascending node			
		22 47	Algol at minimum			
Sun.	30	21	Saturn stationary			

†Southern Area 14-15

‡on a line of sight of the Sun, CE Area, between S. Pleiades



## 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.

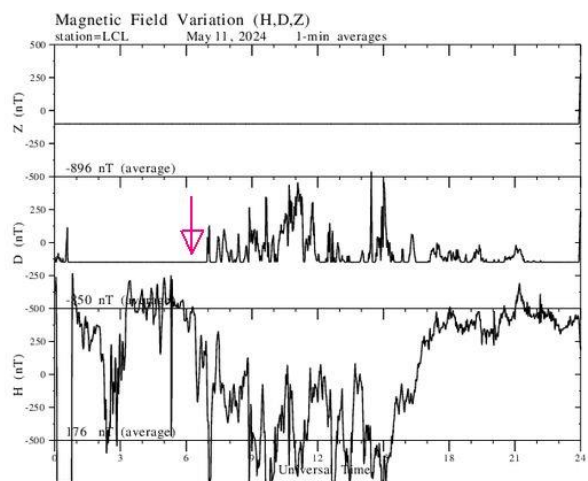
# AURORA AND COMETS

Tenho Tuomi



Aurora from the May 10th storm, taken at midnight toward the south-west.

My magnetometer reading for May 10-11 showing my picture taken at the beginning of the main storm.



Comet C/2023 A3 (Tsuchinshan-ATLAS), 20 minute exposure, May 28th.

Comet C/2021 S3 (PANSTARRS), 17 minute exposure June 3rd.

Pictures processed to emphasize the satellite tracks.



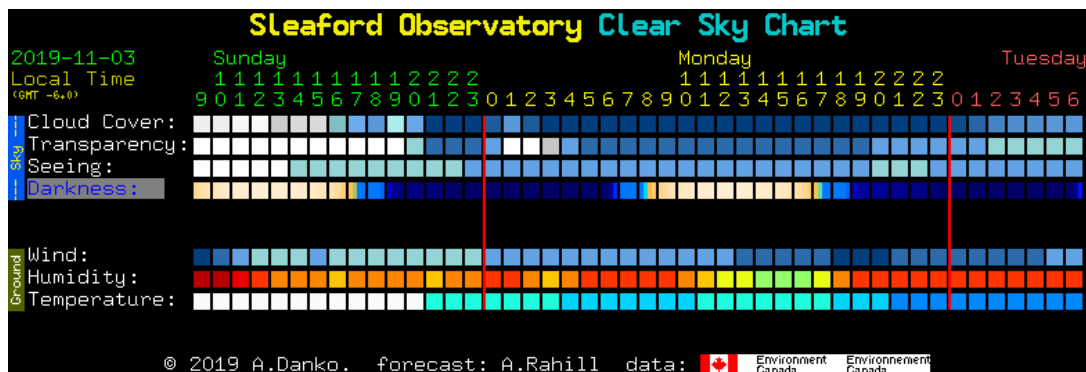


## CLEAR SKY AND WEATHER INFO

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)

# PRESIDENT'S MESSAGE

Brent Burlingham

I wanted to share with the club membership some developments the Executive and a committee have been discussing over the last month.

Daryl Janzen from the University of Saskatchewan Engineering Physics department has tentatively offered the club a SkyShed Pod Max dome that is currently situated on the roof of the Physics building on campus. It was donated to the U. of S. by the Tarasoff family, and was home to the Tarasoff telescope which has since been moved to Sleaford.

As many of you may be aware of, the club has voted to dispose of the 16" Meade telescope currently in storage at Sleaford. However, only 30% of the membership responded to the survey, and half of the respondents voted to sell the telescope. The other half of respondents voted to either 1) build an observatory for club use at Sleaford or 2) build an observatory and automate it for remote robotic club use.

Given that there appears to be some interest in an observatory for club use, and the opportunity to procure a suitable dome has presented itself, the Executive decided to put the sale of the Meade 16" on hold. We want to consider the costs and effort involved in moving the dome from the roof of the Physics building to Sleaford to house the Meade 16" telescope.

As a first step, Yannis Pahatouroglou had organized a committee consisting of myself, Darrell Chatfield, Colin Chatfield, and Jeff Swick to meet with Ted Toporowski from the Physics Machine Shop to view the dome and determine its suitability for our use, and provide an estimate of the costs involved in moving it to Sleaford. Photos from our meeting on the roof of the Physics building May 24<sup>th</sup> follow.

The dome is a large version of the SkyShed Pod (it's 12.5' with 4 bays extending to 18'), and designed to house up to a 32" telescope. Automating it has proved a challenge as temperature changes require constant adjustment of the dome mechanics.

We intend to provide an approximate budget for the project to the club, and to survey members again to determine whether or not there is interest and an appetite for an observatory at Sleaford housing the Meade 16". Automation won't be considered at this point, as it may not be possible without a huge investment in the dome and a new mount for the telescope.

Please let your Executive know if this possibility is something that interests you – we need your feedback and engagement to make this decision! Clear Skies!



## NEWSLETTER MAILOUTS

**Please note** that at the June 17th meeting, we're going to discuss sending out printed copies of the newsletter. Member feedback is requested on this topic.



# MINUTES OF MAY MEETINGS

Lorie Tedford

**Minutes of the Monthly Executive Meeting of the RASC Saskatoon Centre  
Monday, May 13, 2024 - 7:00pm. Hybrid: Online & In person: U of S Observatory**

**Attending:** Brent Burlingham, Lorie Tedford, Les Dickson, Yannis Pahatouroglou, Joelle Sheard-Patrick, Colin Chatfield, John Takala, Darrell Chatfield

- 1. Call to order** 7:00 pm – Brent Burlingham (President and Chair)
- 2. Approval of the Executive meeting minutes for April 2024** as printed in the May newsletter. Moved by Les Dickson, seconded by Joelle Sheard-Patrick; carried.
- 3. Call for additional announcements/items to add to the agenda.**
- 4. Announcements from the Chair** – Brent Burlingham  
No announcements presented.
- 5. Old Business - Reports from the Executive Council**
  - 5.1 President's Report – Brent Burlingham**
    - The sale of the Meade 16" scope is temporarily being put on hold to look into the offer of the observatory from the U. of S.
    - Yannis is coordinating a committee of interested members to get together to inspect the dome, determine costs and appetite from the club.
    - Discussed the potential of collaboration with Tim Yaworski for outreach events.
  - 5.2 Acting Treasurer – Les Dickson**
    - None presented.
  - 5.3 National Council Rep – Joelle Sheard-Patrick**
    - No announcements presented.
  - 5.4 Activities Coordinator – Joelle Sheard-Patrick**
    - Wildwood Star party was a success, lots of engagement from the kids.
    - Improve communication within the club for when members are going to Sleaford etc. for others to join.
  - 5.5 By-Laws Committee – Les Dickson**
    - No announcements presented.
  - 5.6 SSSP 2024 Update – Les Dickson**
    - Camping reservations and registration are now open with limited spots left.

### **5.7 Sleaford Update – Darrell Chatfield**

- The user manual and website needs to be updated.
- Discussed the progress of adding cameras since there was people using the site but not sure who.

## **6. Old Business**

### **6.1 Sleaford – Site Maintenance**

- The proposal of a grass cutting and/or snow blowing schedule with members who are interested in helping.
- Discussed waiting until the fall to sell the snow blower.

## **7. Motion to adjourn** by Yannis Pahatouroglou; carried. 7:55 PM.

## **Minutes of the Monthly Executive Meeting of the RASC Saskatoon Centre Monday, May 13, 2024 - 7:00pm. 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** – 8:15 pm – Brent Burlingham (President and Chair)
  - 3. Call for additional announcements/items to add to the agenda.**
  - 4. Call out to new members/guests:** Michelle Thaller.
  - 5. Adoption of the April General meeting minutes** as printed in the May newsletter.  
Moved by John Takala, seconded by Darrell Chatfield, carried.
  - 6. Executive Meeting Summary** – Brent Burlingham
    - Discussed waiting to put the Meade 16” scope for sale until the opportunity of using the observatory offered by the U. of S was investigated and discussed.
    - Potential collaboration with Tim Yaworski for outreach events, details pending.
    - Discussed hiring the RM to clear snow and cut grass at the beginning and end of the year.
    - Discussed waiting until the fall to sell the snowblower from Sleaford.
- 6.1 (Acting) Treasurer: Les Dickson**
- Discussed hiring an accountant to fix the financial report so there is no issues going forward.
  - Motion to pay the liability insurance renewal bill made by Les Dickson, carried.

7. **New Business** – no items brought forward to discuss.

8. **Program**

8.1 The Upcoming Sky presented by Colin Chatfield

8.2 Dr. Michelle Thaller “James Webb Space Telescope Update”

9. **Call to adjourn** – Moved by Yannis Pahatouroglou, seconded by John Takala; carried.



*May 10th aurora east of Saskatoon. This was facing south. Taken by Colin Chatfield*

## 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](http://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** 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](http://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	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
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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
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
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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: <https://www.rasc.ca/certificate-programs>

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

Chatfield Binocular List is at: [https://saskatoon.rasc.ca/Chatfield\\_Binocular\\_List.pdf](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>