

Saskatoon Skies

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

Volume 56, Number 03

March 2025



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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 - Brent Burlingham

Vice-President - John Takala

Secretary - Lorie Tedford

Treasurer - Les Dickson

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

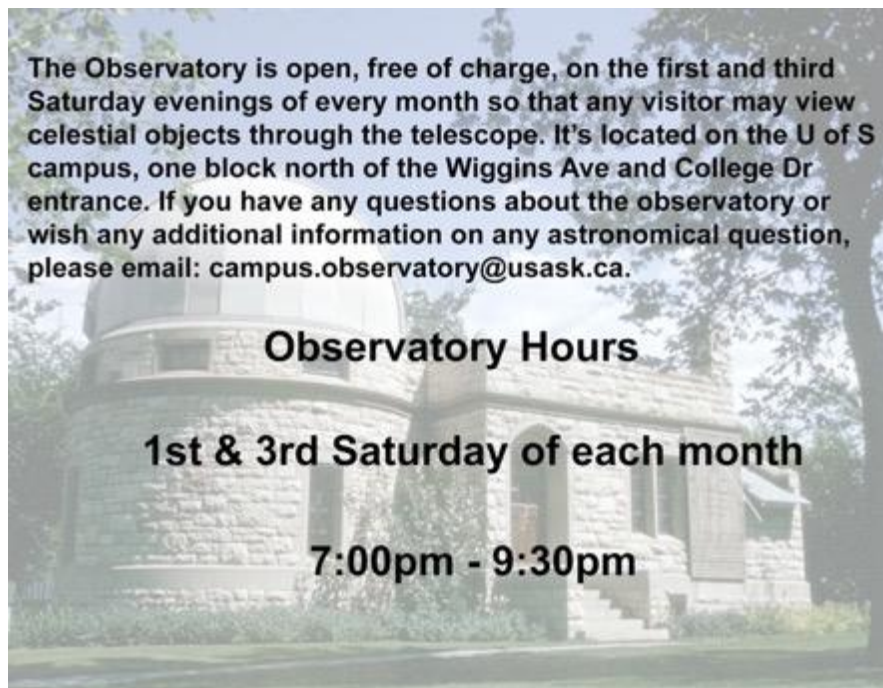
Copy & Collate - Les & Ellen Dickson

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/facilities/observatory.php>

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

RASC CALENDAR OF EVENTS & MEETING INFO

Mar 17	RASC Saskatoon Centre General Meeting	Brent Burlingham
Mar 29	Observer's Group/Messier Marathon - 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>

March RASC General Meeting

for all members and guests

Join us on March 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

“Before the Big Bang” - Yannis Pahatouroglou

SASKATCHEWAN SUMMER STAR PARTY 2025

Les Dickson - Chair of SSSP 2025

Welcome to SSSP 2025!

Members of the Saskatoon and Regina Centres are busy planning the 28th Saskatchewan Summer Star Party.

SSSP is held at the Cypress Hills Interprovincial Park Center Block, 30 km south of Maple Creek on Highway 21. It runs from noon of Wednesday August 20 to noon Sunday August 24.

Attendees have the option of camping in the Meadows or Dark-Sky campgrounds or staying in the Resort, which has hotel rooms, cabins and townhouses available. Camping spots are assigned on a first-come-first-serve basis and booked through Rick Huziak rather than through the Provincial Reserve-a-Site website.

Important Dates:

- April 12 8:00 am – Camping bookings open
- April 15 – Early Registration opens
- April 15 – The Provincial Reserve-a-Site opens
- June 16 – Release of unreserved Resort accommodations
- July 12 – End of Early Registration
- August 20 – SSSP 2025!

Guest Presenters (so far):

- Dr. Chris Herd, Professor in the Faculty of Science – Earth & Atmospheric Science Administration, University of Alberta
- The RADSAT-SK2 Project Team, College of Engineering, University of Saskatchewan

We encourage our members to come to SSSP to enjoy the daytime activities and the dark skies, but also to **help us make it a success.**

For more information, see the website at <https://sssp.saskatoon.rasc.ca>.

Contact us at sssp.sk@sasktel.net or call Rick Huziak for camping and registration information at 306-280-1899 (cell) or Les Dickson at 306-270-9184 (cell).

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

PRINTED NEWSLETTERS

Please note that starting with the December 2024 newsletter, the printed newsletters will not be mailed any longer.

MINUTES OF FEBRUARY MEETINGS

Lorie Tedford

Minutes of the Monthly Executive Meeting of the RASC Saskatoon Centre Monday, Feb 10th, 2025 - 7:00 pm Hybrid: Online & In-person: U of S Observatory

Attending: Brent Burlingham, Lorie Tedford, Les Dickson, Joelle Sheard-Patrick, Colin Chatfield, Darrell Chatfield, George Charpentier, John Takala, Yannis Pahatouroglou, Mark de Jong, Tenho Tuomi, Jeff Swick.

- 1. Call to order** 7:00 pm – Brent Burlingham (President and Chair)
- 2. Approval of the Executive meeting minutes for January 2025** as printed in the February newsletter. Moved by Joelle Sheard-Patrick, seconded by Darrell Chatfield; carried.
 - 2.1 Amendment** to the January minutes to reflect that 7.3 SSSP motion was carried.
- 3. Call for additional announcements/items to add to the agenda.**
- 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 Lorie Tedford and Les Dickson for the work on the club reports for RASC National. Thanks to all that contributed to the January newsletter. As well as thanks to Yannis for arranging the Saturday workshops and to Nick for instructing the workshops.
 - 5.2 Acting Treasurer** – Les Dickson
 - Discussed the report to submit to National. Final review will be sent to the Executive before submission.
 - 5.3 National Council Rep** – Joelle Sheard-Patrick
 - An order for outreach material has been placed.
 - There are training session for laser pointer certifications.
 - GA Meeting taking place on April 26-27th virtually.
 - The RASC website will be splitting into different sectional to have a members only site. Use “securerasc.ca”.
 - Upcoming Citizen Science Workshop and Townhall on Sunday February 23rd online.

- National is looking to provide more activities for outreach focused on students and beginners.
- Donation campaign raised \$20,000.

5.4 Activities Coordinator – Joelle Sheard-Patrick

- The RASC has been asked to do a presentation for the Girl guides to help earn their science badge, still need to set up a date for a presentation with possible viewing if it isn't too cold.
- Meewasin Planet viewing event with Tim Yaworski February 7th from 7-9 pm at Beaver Creek, February 8th is the backup if warranted. Members volunteered to bring out scopes. The event is sold out.
- Meewasin Lunar Eclipse event with Tim Yaworski on March 13th at 10 pm at Beaver Creek.
- The RASC had a booth set up at the Blades game for their Space themed hockey game. Joelle and Lorie handed out moon guides and star gazers.

5.5 Sleaford Update – Darrell Chatfield

- The RM will clear the snow before the next observers group.
- Darrell sent out information in the January newsletter regarding the breakers in the warm up shelter, the wrong breaker was turned off. Please refer to the newsletter or contact Darrell for any questions regarding set up/shut down of the warmup shelter.

5.6 Fundraising Update – Verity Moore-Wright

- None to present.

6. Old Business

6.1 Ike Thiessen – Memorial

- Darrell presented the design for the memorial plaque. The plaque will be ordered after revisions are made.
- Motion made by Darrell Chatfield to purchase a second plaque to commemorate the founding fathers, seconded by John Takala. Carried.

6.2 Club Assets Update

- An inventory of the club assets needs to be compiled for our insurance.
- Need to have an assessment of the value of the items, determine if they are of use or if they need to be included.
- Darrell, Jeff and Nick will make a master list of all items. Darrell has made progress on a few of the items.

6.3 Post Processing Workshop Sessions at the U. of S. Observatory

- An Image Processing Workshop is happening at the U. of S. Observatory on February 1, 8, 15, 22 and March 1 from 1-5 p.m. Contact Nick if you are interested in participating.

6.4 Newsletter

- Motion made by Les Dickson to remove the option for membership to sign up for a printed newsletter as well as to disregard printing of the newsletter, seconded by Joelle Sheard-Patrick. Carried.

7. New Business

7.1 Concern about price to attend Meewasin for Dark sky events.

- It was discussed that the planet viewing event was a specific fundraiser for Meewasin as they do not have any funding this year and this will not be the case for all events. Brent is going to reach out to say that advertising needs to reflect that the event is a fundraiser.

7.2 Suggestion of adding a “Beginner’s Guide to Using a Telescope” workshop.

- Discussed hosting a few beginner sessions on Saturdays after the Image Processing Workshop is completed.

8. Motion to adjourn by Les Dickson, seconded by Joelle Sheard-Patrick; **carried.** 8:06 PM.

Minutes of the Monthly General Meeting of the RASC Saskatoon Centre Monday, Feb 10th, 2025 - 8:15 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** – 8:25 pm – Brent Burlingham (President and Chair)
- 3. Call for additional announcements/items to add to the agenda.**
- 4. Call out to new members/guests:** 2 new guests.
- 5. Adoption of the January General meeting minutes** as printed in the February newsletter. Moved by Lisa Caldwell, seconded by Les Dickson, carried.
- 6. Executive Meeting Summary** – Brent Burlingham
 - The Meewasin Planet Viewing event with Tim Yaworski is on February 7th from 7-9 pm at Beaver Creek. Back up day is February 8th. The event is currently sold out. There was confusion from the public over the price of the tickets for this event. It was a special fundraising event for Meewasin as they do not have funding, but the advertising did not reflect this.

- The Girl Guides have requested a presentation from the RASC to help earn their science badge, details to come.
- There was also a booth set up at the Blades game for their Space night hockey game.
- National has requested financial, centre and eclipse activity reports by March 7th. Final drafts will be sent to the Executive for review before submission. Thank you to Lorie and Les for compiling the reports.
- National has a few activities coming up (see Executive minutes for dates), they are also providing more outreach materials for students and laser certification training.
- A memorial plaque is being ordered for Ike Thiessen as well as an additional plaque for the founding fathers of the centre. Thank you to Darrell for organizing the plaques.
- Nick Larsen is running an Imaging Process Worksop on Saturday afternoons from February 1st to March 1st 1-5 pm at the U. of S Observatory. If you are interested in participating reach out to Nick for details. Thank you to Yannis for arranging the use of the Observatory and thank you to Nick for instructing.
- Darrell, Nick and Jeff are continuing to compile an inventory list of all the equipment in possession of the club to determine the value and whether it needs to be included in our insurance as the insurance policy is needing to be updated.

7. Program

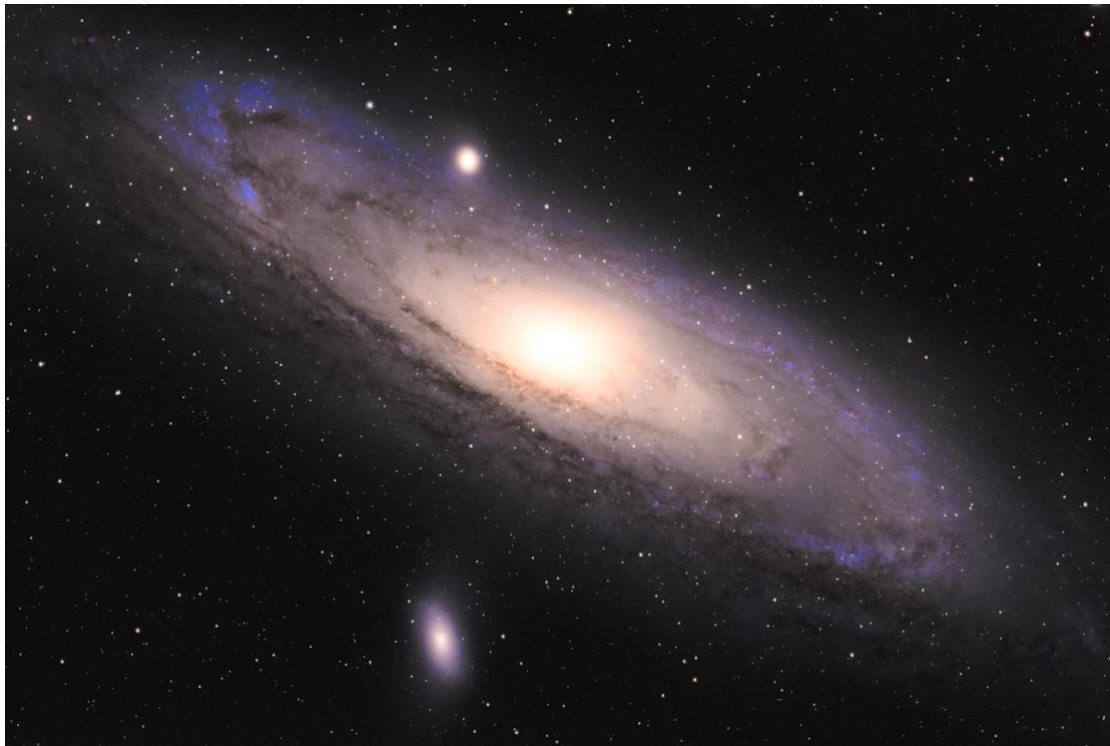
7.1 The Upcoming Sky presented by Colin Chatfield.

7.2 Comparison of DSLR, CCD, CMOS Cameras for Photometry presented by Mark de Jong.

8. Call to adjourn – Moved by Yannis Pahatouroglou; **carried.**



“Tim and Jeff supplied scopes the MVA fundraiser at Beaver Creek. They sold all the seats and had a waiting list of 124 people even with the bitter cold. Just as we were getting ready to pack up, the group all donned snowshoes and went on a guided night hike.” - Jeff Swick



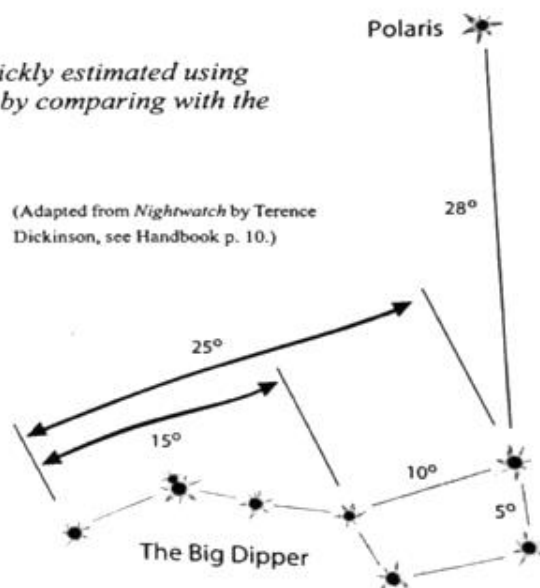
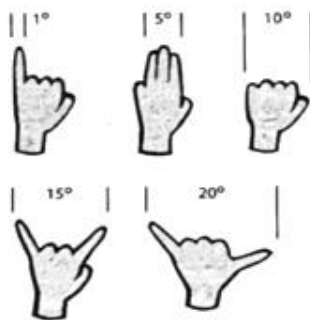
5 hours total exposure on Andromeda taken with my Redcat 71 and ZWO 183mc pro camera. Bortle 3 sky. Taken by Nick Larsen

MARCH 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

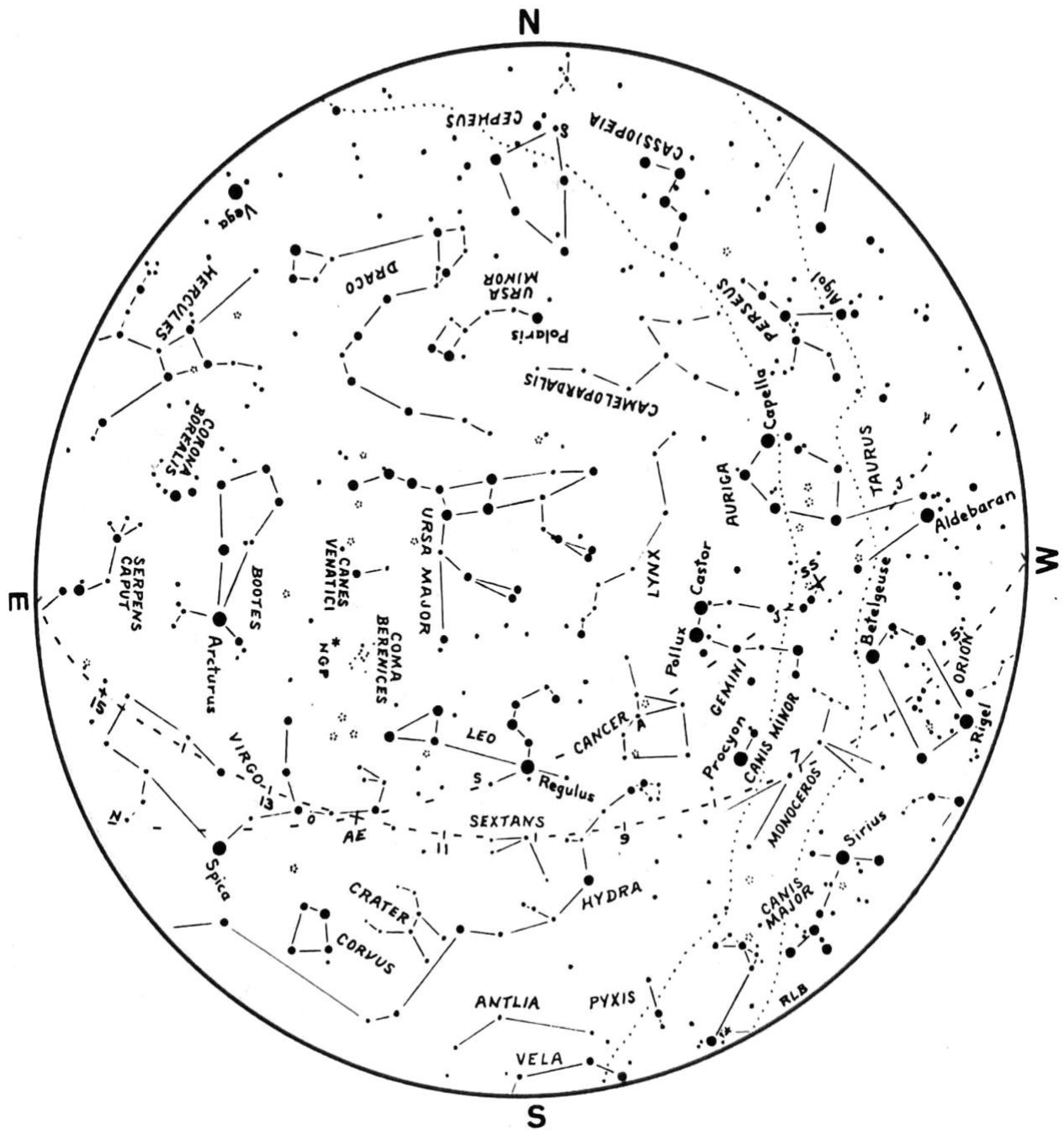
Angular measure in the sky can be quickly estimated using the fingers of an outstretched arm, or by comparing with the star separations in the Big Dipper.



RASC OBSERVER'S HANDBOOK 2024 – STANDARD EDITION

Time (UT)		MARCH EVENTS	Jupiter's Satellites	
d	h m		West	East
Sat.	1 4 5 21 23	Mercury 0.4° N of Moon, occultation ¹ Moon at ascending node Moon at perigee (361 964 km) Venus 6° N of Moon		1.0 2.0 3.0
Sun.	2			4.0
Mon.	3 13 01	Algol at minimum		5.0
Tue.	4 23 37	Double Shadows on Jupiter		6.0
Wed.	5 13	Mercury at perihelion Moon 0.6° N of Pleiades (M45)		7.0
Thu.	6 9 50 12 16 32	Algol at minimum Jupiter 6° S of Moon first quarter		8.0
Fri.	7			9.0
Sat.	8 6	Mercury greatest elongation. E (18°)		10.0
Sun.	9 0 6 39 12	DAYLIGHT SAVING TIME BEGINS Mars 1.7° S of Moon Algol at minimum Pollux 2.0° N of Moon Mars at greatest heliocentric lat. N		11.0
Mon.	10			12.0
Tue.	11			13.0
Wed.	12 1 18 2 42 3 28 10	Moon at ascending node Double Shadows on Jupiter Algol at minimum Saturn in conjunction with the Sun Venus at greatest heliocentric lat. N		14.0
Thu.	13			15.0
Fri.	14 6 55 13 45 21	full Moon Moon at descending node Total Lunar Eclipse (p. 126) Mercury stationary		16.0
Sat.	15 0 17	Mercury at greatest heliocentric lat. N Algol at minimum		17.0
Sun.	16 20	Zodiacal light vis. in N lat. in W after evening twilight for next two weeks Spica 0.4° N of Moon, occultation² Moon at apogee (405 754 km) Algol at minimum		18.0
Mon.	17 17 21 06			19.0
Tue.	18			20.0
Wed.	19 6 43	Double Shadows on Jupiter		21.0
Thu.	20 0 9 01 17 55	Neptune in conjunction with the Sun Equinox Antares 0.5° N of Moon, occultation³ Algol at minimum		22.0
Fri.	21			23.0
Sat.	22 11 29 18	last quarter Juno stationary		24.0
Sun.	23 1 5	Venus in inferior conjunction Vesta stationary Earth passes to S side of Saturn's ring plane		25.0
Mon.	24 14 44 20 21	Algol at minimum Mercury in inferior conjunction Pluto 0.9° N of Moon, occultation*		26.0
Tue.	25			27.0
Wed.	26 11 33	Algol at minimum		28.0
Thu.	27			29.0
Fri.	28 16 29	Moon at ascending node		30.0
Sat.	29 8 22 10 58	Algol at minimum new Moon (lunation 1265) Partial Solar Eclipse (p. 129) Moon at perigee (358 128 km) Large tides		31.0
Sun.	30			
Mon.	31			

¹Kerguelen Is., Australia, Melanesia, most of Micronesia, NW Polynesia, 2E central Africa, 3M...



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.

ON LEAVE FROM ASTRONOMY

Tenho Tuomi

First I ran out of comets to photograph. Since December 5 when I photographed my last new comet, there has been nothing new to photograph. In fact the only comet left in the sky bright enough to photograph is comet C/2023 A3 (Tsuchinshan-ATLAS) at magnitude 12.5, which was so bright in October.

Secondly it has been the weather. Since photographing Mars on January 9, I was not to the observatory until February 24. For almost two months it was always cloudy, or stormy, or cold down to -34.5°C .

Thirdly the deer dug holes in the snow on February 11 on our doorstep to find shelter and slept for several nights on the path to the observatory.



By the time the storms and drifting snow settled there was up to three feet of snow almost all the way from the house to the observatory.

Fourthly on February 20 the coyotes killed a deer and were feeding on it during the nights on the path to the observatory. Eventually on February 29, the day after this picture was taken, they dragged it completely out of the yard.

On February 24, after some missteps I was able to pick a path over the snow where the crust was thick enough to support my weight and got to the observatory. I took a picture of Venus in the day time. My first astronomy picture in 46 days.





Then at night I found my way again over the snow with a flashlight and took a picture of the Pleiades.

However I do not feel secure walking over that high path at night at my age so probably will not be back at the observatory again until the snow melts, unless of course if a new comet shows up in the sky.



UPCOMING EVENTS

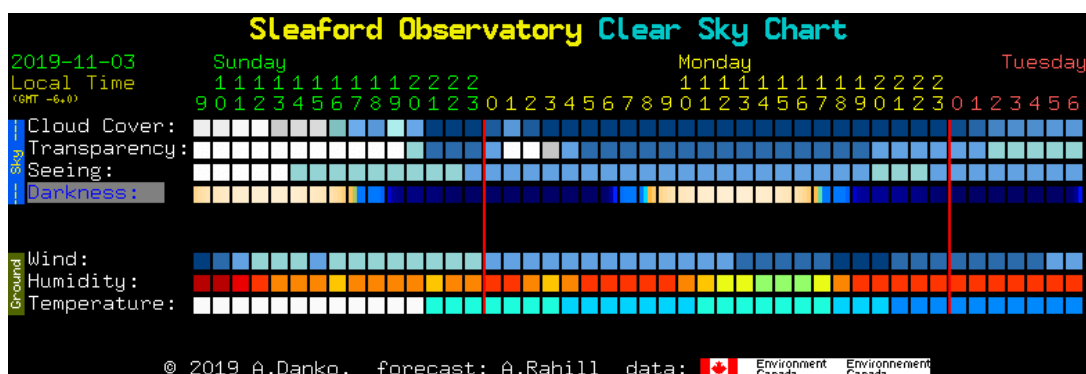
- Nick Larsen will be hosting an introduction to astrophotography course at the U of S observatory, however the date is yet to be determined. We will be discussing this at the next meeting so I will set a solid date.
- There's also another Meewasin fundraiser arranged by Tim Yaworski at Beaver Creek for the lunar eclipse on March 13th at 10 PM. Registration required. See the website - <https://meewasin.com/darkskies/>.

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

DIGITAL SETTING CIRCLES

Brent Burlingham

I recently purchased a used Celestron Orange Tube C8. The telescope was in very good shape, at a great price and without a tripod which I happened to have sitting around from another scope.

I have never learned to star hop. I had used DSC's (Digital Setting Circles) with a previous C8 I owned, so I started trying to find a used set. Digital Setting Circles use encoders to read the position of the RA and Dec axes, and have a database of coordinates to assist in pushing the scope to the desired object. Ancient technology in today's go-to mount world, but it can do the trick without breaking the bank on a fancy new mount.

DSC's were mostly made by a company called Talligent and re-branded by Celestron, JMI Mobile and Orion. I couldn't find used DSC's anywhere, so I placed wanted ads on Astrobuysell and Cloudy Nights. A few months later, a kind soul on Cloudy Nights pointed out an ad for a set in Tennessee that I had missed. They were only \$80 with two encoders – a great deal considering I had paid \$800 for my last JMI DSC's. With exchange and shipping, the final cost was \$180.

The DSC's arrived and the fun began. They were mounted on a different type of scope, so I had to get creative mounting the encoders. The Declination encoder ended up in this whacky mount:



Note the gracefully JB Welded set screw to accept the encoder post and tie it to the axis bolt.

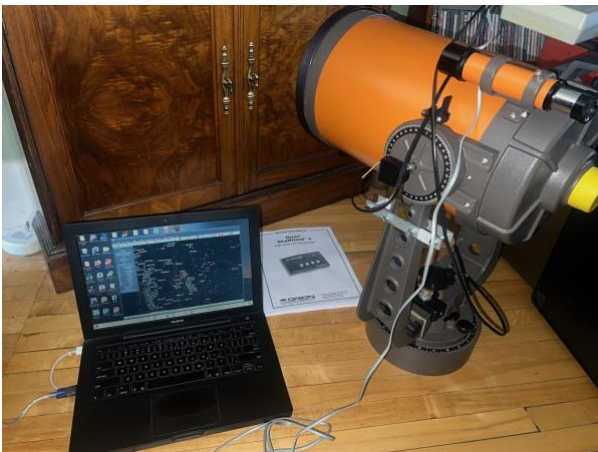


The RA mount was trickier, but I managed to press an old iPhone tripod mount into service with another JB Weld job on the axis bolt.

I pressed yet another iPhone tripod mount into service to hold the DSC computer in place on the scope:



I'm a retired computer programmer, and I enjoy maximizing my failure points digitally. I fired up my old 2009 MacBook running Windows and got Earth Centred Universe running and talking to the DSC through an ASCOM driver. Earth Centered Universe is an astronomy app written by RASC's David Lane (who sadly passed away last year) on a bet from a friend who dared him to write a planetarium program as good as those he was using on the Mac. Through an arrangement with David's widow, ECU 6.2 is now available for free at <https://www.nova-astro.com/ecupro.html>.



It's an excellent piece of software, and it will work with almost any scope through the ASCOM drivers.

Everything is working theoretically, but I need to get out and see if I can actually find things with this contraption.

Clear Skies!

CENTRE TELESCOPES

Jeff Swick

Other than our three rental scopes, our Centre has a fairly large inventory of telescopes that have been donated to us over the years. As we are not really in the collecting business there had been some discussion as what to do with them. One of the suggestions is to sell them to our members but as of now, nothing has been decided and more discussion is needed as to what all instruments we have.

One of the scopes we have is a Meade LXD55 EMC Refractor. It is a 6-inch apochromatic refractor. Here are some of its specs:

5" f/9.3 Model AR-5, AR-5EC Specifications

Optical design.....	Achromatic Refractor Clear
aperture.....	5" (127mm)
Focal length	1180mm
Focal ratio (photographic speed)	f/9.3
Resolving power	0.90 arc secs
Coatings	Meade EMC Super Multi-Coatings

I took it Beaver Creek for an event and put it through its paces. Because it was a public event, I didn't take my best eyepieces. It split close double stars extremely well and views of the belts of Jupiter and the lunar surface were better than expected. I would highly recommend this instrument for photography as well. I hooked my Nikon DSLR to last fall and got some very detailed shots of leaves from about half a kilometre away or so.

The instrument isn't that heavy either at 15 pounds. I ran it on my Celestron CGEM II with absolutely no problem at all. I would also run it on my AVX as is but I wouldn't want to run a fully loaded astrophotography rig with it. On the AVX it would be running close to its limit and holding it rock steady in a breeze might be an issue.

If you decide this instrument might be something you are interested in, make sure you have a robust mount. The optics in it is exceptional but it is a bigger scope than it appears in the photos below.



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
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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

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

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