Saskatoon Skies

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

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Fantastic picture taken by Garry Stone of the lunar eclipse on January 20th.
Taken at 11:53pm, -14°C, clouds clearing just in time for the shot.

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http://www.usask.ca/rasc/newsletters.html

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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-us

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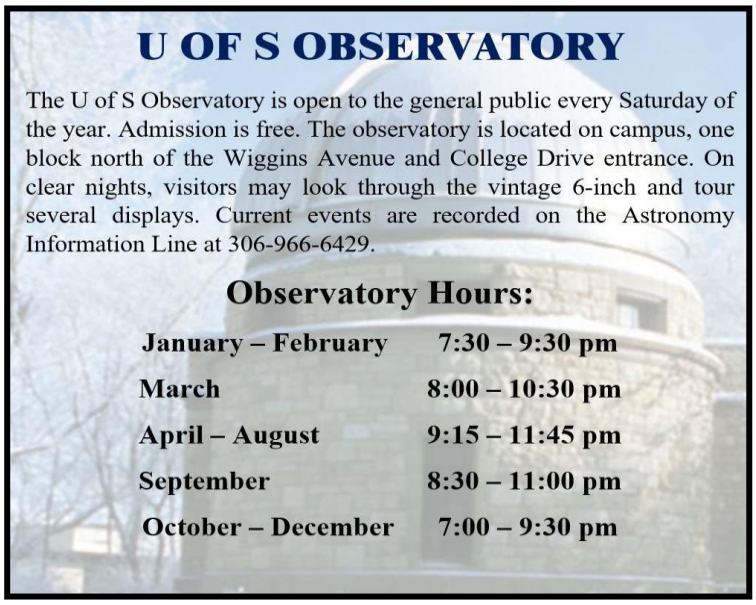
- use of the Sleaford Observatory
- use of the U of S Observatory (after training)
- Saskatoon Skies Newsletter
- Observer's Handbook
- Journal of the RASC (electronic format)
- SkyNews Magazine (bimonthly)
- borrow the Centre's Data Projector to give astronomy outreach presentations – contact Les Dickson at astrochem@sasktel.net
- rent the Centre's Telescopes https://www.usask.ca/rasc/telescopes.html
- discounts to Sky &Telescope Magazine*
- use of the Centre library



SASKATOON CENTRE'S
MAIN OFFICERS:

President – Daryl Janzen
Vice-President – Jim Goodridge
Secretary – Marcel Müller-Goldkuhle
Treasurer – Norma Jensen
National Council Rep – Chris Martin

Bottle Drive &
Canadian Tire $
By Les Dickson

If you cannot attend a meeting but would like to donate your Canadian Tire money please email me at astrochem@sasktel.net

LIGHT POLLUTION ABATEMENT WEBSITE AT: www.ras.sk.ca/lpc/lpc.htm

Newsletter Editor – Kris Ohnander, Colin Chatfield
Copy & **Collate** – Les & Ellen Dickson
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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 krisohn@gmail.com in msword or text format. Images: any format, less than 30MB, sent by e-mail as attached files. **Deadline for submission of all articles for an upcoming issue is the first Friday of the month!**

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RASC CALENDAR OF EVENTS

February 25	**RASC General Meeting**	Daryl Janzen
February 28	**Youth Astronomy Club Meeting**	Ron Waldron
March 2	**Observers Group at Sleaford**	Larry Scott
March 18	**RASC General Meeting**	Daryl Janzen
March 25	**Youth Astronomy Club Meeting**	Ron Waldron
March 30	**Observers Group at Sleaford – MESSIER MARATHON**	Larry Scott

For a complete list of club events, please visit: http://www.usask.ca/rasc/activities.html

February RASC General Meeting

for all members and guests, Room 175,
Physics Bldg. University of Saskatchewan
Join us on February 25, 2019 at 8:00PM

Presentations by:

Marcel Müller-Goldkuhle – *What's in the Sky in February?*

Colin Chatfield – *Social Media in a Nutshell*

Colin will explain some of the pros and cons of social media and how the club currently uses it. Colin is a photographer and educator with a keen interest in night sky photography. Colin states he is not an expert, but enjoys what he does and loves learning.

Jim Goodridge – *Binocular Observing: Resources Available to Enhance Grab'n'Go Astronomy*

A survey of books, websites and observing lists for binoculars as well as tips and tricks PLUS measuring your exit pupil to match to binoculars and eyepieces. ***Jim*** *has been an active visual observer for a number of years. Jim has served on the SSSP organizing committee, was President and Vice-President of RASC Saskatoon Centre and volunteers as a guide at the University of Saskatchewan Observatory. Jim is a believer in "grab 'n' go astronomy" which involves observing from the backyard in light polluted skies for short durations, especially in the winter. Binoculars are a great tool for this type of observing.*

Note: There will be an Executive Meeting at 7:00PM

Minutes of the January Meetings

— Marcel Müller-Goldkuhle

Minutes of the Executive Meeting, January 21, 2019

Attendees**:** Daryl Janzen, Rick Huziak, Les Dickson, Ellen Dickson, Ron Waldron, Darrell Chatfield, Tenho Toumi, Mark de Jong, Norma Jensen, Marcel Müller-Goldkuhle

Meeting called to order by Daryl Jensen at 7:11 PM

Minutes:	Comments: Name Spelling to be corrected: Daryl Janzen, Ike Thiessen. Approval of the minutes from the Nov 19 meeting: Motion by Norma, seconded by Mark, approved with all in favour.
President's message:	Daryl gave an update about his plans for the Club. Major topics are the public outreach and to look for opportunities where the Club and U of S can cooperate.
Timing of meetings:	No decision made to change day and/or time of either of the meetings.
Eclipse Event:	About 300 people joined the event, communication via social media has proven to be very effective. Interviews about the eclipse were given by Chris Marten, Daryl Janzen, Tim Yaworski.
Meeting venue:	Alternative to room 175 could be the observatory. Wheelchair access would be an issue. Other alternatives might be available. Further discussion in upcoming meetings.
SSSP:	Les asked for a motion to get agreement by the executive about the intent to purchase a new projector and potentially a laptop. Approval for purchase is planned to be a separate step after investigation by Les about requirements (hard- and software), buying options and costs. Motion by Marcel, seconded by Darrell, approved with all in favour. Daryl to check with IT of the U of S if they can give a recommendation. Prepayment deposit of resort accommodation and conference room booking could be reduced from 8,400 $ to 3,300 $.
Sleaford:	Pedestal planned to be built at the south west corner of the shed. Darrell is working to get a quote from the electrician. Concerns were raised about racoons in the schoolhouse.

Due to lack of time it was decided to discuss further topics via email.
Meeting adjourned at 8:03PM.

Minutes of the General Meeting, January 21, 2019

Meeting called to order by Daryl Janzen at 8:15PM.

Minutes:	Approval of the minutes from the Nov 19 meeting: Motion by Ellen, seconded by Tenho, approved with all in favour.
Treasurer:	Norma gave an update about the financial report.
Events:	Tim Yaworski suggests to have a public event along the river in spring, e.g. around May 11, a volunteers list was circulated.
U of S Observatory:	Daryl asked if there is interest by Club members to get an orientation by a student to use University telescopes. Several Club members showed interest.
	Light Pollution Abatement Committee – Rick Huziak (Chair)
	Constitution Committee – Jim Gorkoff, Tenho Tuomi

Meeting adjourned at 8:45 PM, followed by presentations.

Presentations:	Marcel Müller-Goldkuhle: The January Night Sky.
	Tenho Tuomi: Update on Comet Wirtanen – with New Images.
	Rick Huziak: The online AAVSO Chart Plotter Utility and its other uses.

More on Speakers…and, Thanks! – *Rick Huziak*

I would like to thank those who have already volunteered to provide talks for the RASC General meetings in response to my article in the January issue. So far, Jim and Colin will talk in February, Velma in March, Ron in April, and Ashley and Riley will cover May. Marcel will continue to give his *What's in the Sky* warm-up every month. This is a great start!

That said, I still need a major speaker for March, a major and minor speaker for June, and September comes early, so I'll take bookings into the fall or even into next year. So far I have 7 of 88 members committing to speak … that's 8%. I'm so looking forward to hearing from the rest of you! And if you have a short 5-minute thing to say, we can always fit you into any meeting!

A Follow-up for the AAVSO Chart Plotter

– *Rick Huziak*

Those of you who were able to attend the January meeting saw me present on the usefulness of the AAVSO Chart Plotter for plotting charts for variable star observing, but also useful for checking limiting magnitudes and "blank field" charts for sketching. The URL for the site is www.aavso.org/vsp/ (where vsp = variable star plotter). If you are printing a chart for a variable star just type in the name of the variable, such as R Leo, T Tau, V838 Mon, etc., and chose your chart scale, orientation for your scope, and chose either a dot plot or Digitized Sky Survey image. If you want a field of an object that is not a variable star, then plot the chart using the right ascension and declination of the object in the format HH MM SS.S +DD MM SS. (I.e. 13 29 52.70 +47 11 43.0 gets you M51, 19 59 36.30 +22 43 16.0 gets you M27, 05 35 17.30 –05 23 38.0 gets you the Orion Nebula, depending on how cold you want to be while sketching.) Remember that magnitudes of reference stars plot without a decimal place, so 106 means 10.6 magnitude. Playing with a few charts will let you learn about magnitudes and variable stars, or you can just use the field to make an amazing sketch you can show us at a meeting! If you have any questions about the plotter, give me a call (306-665-3392) or email rickhuziak@shaw.ca.

The Geminids at Sleaford – Dec 13th, 2018

– *Norma Jensen*

Darkest time of the year. Wonderful! Sun so low across the horizon, the days need vigilance in seeing. But, the nights are long. Time to observe as much as possible; the winter stars are out. Observing time, crossed fingers.

Aurora can always arise. And there have been spectacular ones. It can take the sky away or fade back to settle in the north. When you start to pack up for the night, sometimes they pop up. Might as well sit down and watch. There was one display where the auroral oval had dropped far south. The view filled the whole sky and lasted for hours. Time enough for one observer to go to the city and return with family.

But this time, it's the meteor shower we hope to see. The Geminids. Elusive, but not this year. The night was clear, light persistent wind from the south, and -6°C. Five people from the club came out. Two imaging and three sitting looking up. Time passed. The last few left after midnight, but the hours spent were perfect.

Point your chair towards the northeast, lie back and watch. Nothing to do. Let them come to you. Seeing changes as the earth rolled us across the sky. Geminids, white, long, and fast. Short, white flits. Ursids? Two narrow parallel lines south to north just above the horizon.

In between meteors, we were able to see comet 46/P Wirtanen with binoculars. A treat to be under the dark skies of Sleaford.

Thoughts on Observing the Moon – *Norma Jensen*

To explore the moon, there is no better guide than Isabel Williamson. She created a lunar observing list as part of a challenge developed for the Montreal Centre years ago. Thanks to the RASC Observer's Committee, we have available to all moon watchers, a lunar observing program named in her honour. Thanks to all!

The Isabel Williamson Lunar Observing Program (IWLOP) lists required and challenging objects that you can simply check off as you go along. You can also keep information in your log book. This, I found, to be very rewarding. Record you observations anyway you want to: draw, name, or list as found. Take time for this. You should at least record place, date, and time of observation. All are important so there is a framework, if others are interested in finding a particular object based on your notes. Also important is moon phase and day, i.e. 13 day waxing gibbous and general weather conditions such as temperature and wind.

If you are looking at Aristoteles and Eudoxus and are gathering challenge and required features, you can record other features noted in the area. Perhaps later you will add them to a list. Also useful is a log book page # file for moon, Messiers, etc. for easy referral.

Once, in the backyard, I was so engrossed in moon watching that I lost awareness of anything else. I looked away at some point and saw that my 8" dob (which I had Tremclad black) had whitened.

Oh! It's snowing! Guess I had better pack up. So I hauled the scope on its crazy carpet back to the garage. Wonderful evening.

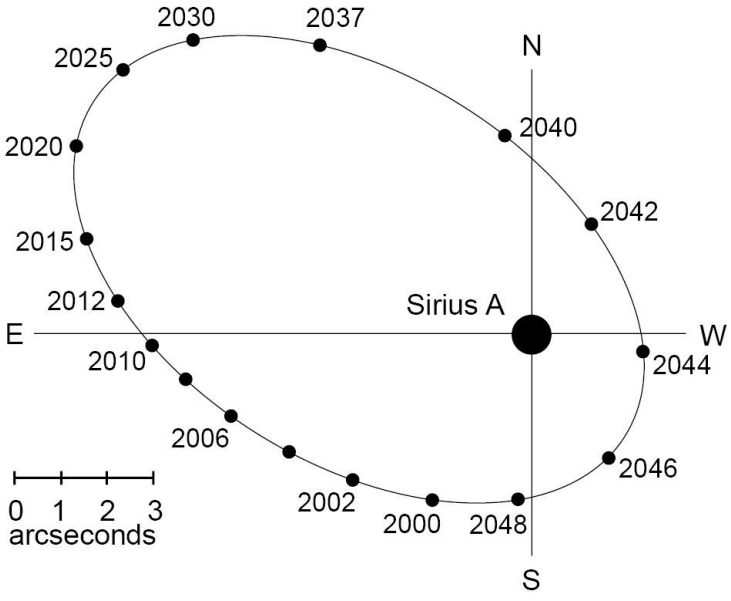
To all sky watchers, consider the moon as a place to spend time in – surprising in its stark beauty and endless patterns and changes.

Sirius' Tiny Little Travelling Partner – *Rick Huziak*

Now that Orion is prominent in the sky, his two hunting dogs, Canis Major and Canis Minor are faithfully following him as he crosses the sky. The brightest star in Canis Major, indeed the brightest star in the sky, Sirius, is the target of this article. Well, not really Sirius itself, though I am serious about the topic, but its tiny companion is what our quest will be.

Sirius is a visual binary star. The binary system is quite young at 200 to 300 million years old (whereas the sun is 4.603 billion years old.) The brighter component, Sirius, or more specifically, Sirius A, is spectral class A0mA1 Va, which is a fancy way of saying it is neutral white in colour and is a dwarf main sequence star of about twice the sun's mass and about 25 times the luminosity. Sirius A is bright mostly because it is very close to us at a distance of only 8.6 light years.

Sirius A has a much fainter white dwarf companion named Sirius B. Sirius B is the closest white dwarf to the earth. Because Sirius B started out as the more massive of the two stars, likely an O- or B-type giant, it consumed its fuel very quickly, and around 120 million years ago it puffed up into a red giant, shed its atmosphere (it would have been a very nice visual planetary nebula for dinosaur astronomers!) and eventually the exposed core evolved into a white dwarf. This little star now contains just about 1.02 solar masses, but is only 8/1000th the radius of the sun, so at 12,000-km diameter it is only about the size of the earth! That much mass squished into that little space makes matter "weigh" about 1.7 metric tonnes per cubic centimetre. That's one heavy sugar cube!



However, Sirius B is notoriously difficult to see because it is very close to Sirius A and the glare from Sirius A makes Sirius B look like a firefly in a spotlight. Sirius B was discovered theoretically in 1844, even before it was seen, since Friedrich Bessel noticed that Sirius's proper motion (path across the sky) was wobbling over many years of observation, deviating from a straight line motion. He correctly deduced that Sirius had to have an unseen companion. This in itself was an amazing feat, since attempting to pin down the precise positon of a glaringly bright object is very hard to do. Eighteen years later, Alvin Clark (of telescope making fame) first observed the companion using the 18.5-inch refractor at the Dearborn Observatory.

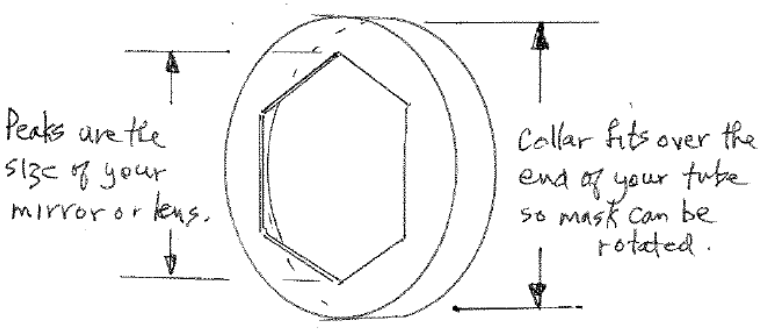
The barriers to chasing down Sirius B are two-fold. The first is that Sirius A is magnitude -1.46 and Sirius B is +8.44. This 10-magnitude difference means that Sirius B is 10,000 times dimmer than Sirius

A! However, at magnitude +8.44, technically, Sirius B would be visible in 7x35 binoculars. Secondly, Sirius B is in 50.13-years elliptical orbit that varies in separation from Sirius A from between 3 arc-seconds and 11 arc-seconds. 11 arc-seconds is only one-third of the separation of Alberio (Beta Cygni), so that's not very much. Then again, many observers can get their telescopes to separate the tight 2.3" and 2.4" pairs of the Double-Double (Epsilon Lyrae). So, separating Sirius A and B is somewhere in between. The diagram shows the orbit of Sirius B about Sirius A, with north up. Newtonian users should rotate the chart 180-degrees, but Cassegrain users would simply flip the chart left-to-right.

So, how do you do it? Luckily, for about the next two decades, the two stars are at near maximum separation. Good. Done deal. Separating an 11 arc-second double star is easy! So the real obstacle becomes how to see a star buried in the blinding glare and scintillation of Sirius A. Looking though a telescope at Sirius will show a brilliant white star that fills the field with a huge brightness. So you will have to use a host of the best observing tricks to pull the tiny companion out of the glare.

1) Make sure your telescope is well-collimated and the optics are decently clean. 2) Observe Sirius at the highest point in the sky when it is directly south. 3) Make sure the sky is really steady. Test a few other double stars to see how easily stars of progressively tighter separation are split on your observing night. A list of close challenge double stars is available in *Observer's Handbook 2019* on pages 291 – 294. If you can't separate a 5 arc-second double of near-equal magnitudes on your observing night, you're not going to be able to separate the much more challenging Sirius A and B. (By the way, *Observer's Handbook 2019* is apparently published by The Royal Astronomical *Societof* of Canada, if you read the spine!) 4) Observe at very high power, which improves contrast and resolution. 5) Build an *aperture mask*!

An aperture mask can help you "play tricks" by creating an artificial diffraction pattern. The outside diameter of the peaks of the mask cut-out is the *same diameter* of your mirror or lens, and the flats of the mask cut some of the light out of the edges of your mirror or lens. The 6-sided mask will create a 6-spike diffraction pattern. Since there is a fixed amount of light coming from Sirius, light stretched into the 6 spikes has to come from somewhere, and what happens is that the central image of Sirius shrinks a little bit, hopefully enough to draw the companion out of the glare. You must also make your mask such that it can be rotated on your tube. You then spin the mask until one of the dark troughs in the diffraction pattern is aligned with where Sirius B should be. Then, viola! Sirius B should appear as a bump in the trough between two of the spikes! (Spiders in Newtonians will produce additional spikes, but they are never in the "right" place!)



So … if this frigid weather every goes away, I would like to see if anyone can separate Sirius B, and it would be interesting to see how small of a telescope can do this. Theoretically, a 1-inch (2.5 cm) telescope can see an 8.44 magnitude star. Thus is the challenge!

Observing Clubs and Certificates

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

Ron Waldron	108
Wade Selvig	75
Marcel Müller-Goldkuhle	81
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:
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Larry Scott	110
Scott Alexander	97
Norma Jensen	83
Sandy Ferguson	23
George Charpentier	13

EXPLORE the UNIVERSE
Certified at 55 to 110 Objects:
T. Tuomi,

Wayne Schlapkohl	55
Jim Goodridge	35

Isabel Williamson Lunar Observing Certificate
Certified at 140 Objects:
T. Tuomi, N. Jensen

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

The Messier, Finest NGC and David Levy's Deep-Sky Gems lists can be found in the *Observer's Handbook*.
The Explore the Universe list is available on the National website.
On-line Messier and Finest NGC lists, charts and logbooks: **http://www.rasc.ca/observing**
On-line Herschel 400 List: **http://www.astroloeague.org/al/obsclubs/herschel/hers400.html**
Binocular List is at: **https://www.usask.ca/rasc/Chatfield_Binocular_List.pdf**
"Isabel Williamson Lunar Observing Program Guide:
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