Saskatoon Skies

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

Vol. 46, No. 09 Sept 2015

The Group Photo for SSSP 2015 at Cypress Hills – Although the weather was temperamental at times, the event was well attended and very successful overall. Photo by George Charpentier.

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

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MEMBERSHIP? JOIN TODAY!

Regular: $85.00 /year **Youth: $45.00 /year** **Family: $80/year**

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. If you do not want to join at this time, ask to get onto our FREE 3-month Temporary Membership list. You will receive regular mailings of our Saskatoon Skies newsletter and will be invited to participate in Centre activities. Members are encouraged to renew early to avoid disruption in publications. Renew through the National Office at http://www.rasc.ca/join-us

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)
- SkyNews Magazine (bimonthly)
- use of the Centre library
- borrow the Centre's Data Projector to give astronomy outreach presentations – contact Les Dickson at astrochem@sasktel.net
- rent the Centre's Telescopes http://homepage.usask.ca/ges125/rasc/telescopes.html
- discounts to Sky &Telescope Magazine*
- free, no-cost, no-obligation, 3-month temporary membership if you don 't want to join right now!

*New subscription or renewal of Sky &Telescope? Send new info or renewal notice, plus credit card # to Norma Jensen, 128 – 4th Street East, Saskatoon, SK S7H 1H8, or email her at norj@sasktel.net.

SASKATOON CENTRE'S
MAIN OFFICERS:

President – Jim Goodridge, 306-370-8530
Vice-President – to be filled
Secretary – Tenho Tuomi, 306-858-2453
Treasurer – Norma Jensen, 306-244-7360

Bottle Drive &
Canadian Tire $
By Jim Goodridge

If you cannot make it to a meeting but would like to contribute your Canadian Tire money please call me at 306-370-8530

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

Newsletter Editor – Ron Waldron
Copy & **Collate** – Les & Ellen Dickson
Labels & Temps – Mark de Jong
Web Posting – Gord Sarty
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 rmwaldron@shaw.ca win msword or text format. Images: .jpg please, no larger than 1 – 1.5 MB, 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

Sept 11-13	**Alberta Star Party**	Rick Huziak
Sept 12	**Observer's Group at Sleaford**	Larry Scott
Sept 8 – 15	**Northern Star Party**	Rick Huziak
Sept 19	**Public Viewing at Beaver Creek**	Rick Huziak
Sept 21	**RASC General Meeting**	
Oct 17	**Observer's Group at Sleaford**	Larry Scott
Oct 19	**RASC General Meeting**	
Nov 7	**Observer's Group at Sleaford**	Larry Scott
Nov 16	**RASC General Meeting**	
Dec 14	**Annual Christmas Social**	

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

September RASC General Meeting

for all members and guests
Room 175 Physics Bldg
University of Saskatchewan
on

Monday, September 21st, 2015

Jim Goodridge will be presenting an introduction to "Good Deep Sky Objects for Beginners"

MAIN PRESENTATION

The 2015 Saskatchewan Summer Star Party in Photos

George Charpentier and Jim Goodridge

Note: There will be an EXECUTIVE MEETING beginning at 7:00 PM

Minutes of the June Executive and General Meetings – *Tenho Tuomi*

Executive Meeting opened at 7 :00 pm. Three members present plus visitors.
Moved by Ron Waldron and Tenho Tuomi that the May 11 meeting minutes be adopted as circulated. Carried.

Committee Reports:

- President's Report by Jim Goodridge. We had solar observing at the Nature City Festival.
- Observer Co-ordinator Report. Observer's Group at Sleaford cancelled on Saturday, rescheduled for nest weekend.
- Newsletter Report by Ron Waldron. Next issue will be in September, deadline September 4.
- Sleaford Site Report by Rick Huziak. Some fixing done at the warmup shelter by Rick and Darrel Chatfield. Possible taker for the old dome.
- Event's Report. Outreach event planned for Beaver Creek before Sleaford open house. Grasslands West Block Star Party, July 25. Saskatchewan Summer Start Party at Cypress Hills Park, August 12-16. October meeting – speaker Randy Attwood, Executive Director from National Office. November meeting – elections.
- SSSP Update by Rick Huziak. All speakers in place.
- National Report by Tenho Tuomi who sits on the National Observing Committee. This committee proposes that the star-hopping requirement be eliminated from the Deep-Sky Challenge Objects and Deep-Sky Gems certificates. Discussion followed. All were against this proposal. It was suggested that this be brought up at the General Meeting for more feedback.
- Sask. Light Pollution Abatement Committee Report by Rick Huziak. Rick gave Swift Current and Yorkton help with their light pollution problems. Rick met with Saskatoon to look at environmental overlays as an incentive for more responsible lighting. Discussion followed regarding some overlit parts of the city.

Other Business

- Jim Goodridge announced that that the Prairie Water Gardening Society donated two coffee perks the Centre.
- Jim Goodridge announced that he will be resigning as president after the next election in November. Vacant positions that will need to be filled are ***President, Vice-President, Newsletter Editor, National representative, and Events Co-ordinator.***

Moved by Jim Gorkoff that the meeting adjourn. (7:55 pm)

The General Meeting opened at 8:15 pm after a coffee break.

Jim Goodridge gave a presentation on Resources for Newcomers. The main speaker was Kenton Lysack, senior Interpreter Meewasin Valley Authority, who started with an Introduction to Saskatoon's Dark Sky Initiative and the Northeast Swale, and the three Meewasin Mandates; conserve, develop and educate. He explained his role in the educate mandate.

Some dates to note – Night of Skyglow Observation, September 12. Observe the Moon night, September 19.

The proposed change to the Deep-Sky Challenge Objects and Deep-Sky Gems certificates was brought up from the executive meeting for discussion. Some agreed with the proposed change but most were opposed.
At 9:10 pm Rick Huziak talked about the rock which Tenho Tuomi had brought to the meeting. It had all the marks of an iron meteorite but after tests was determined to be an unusually large piece of magnetite.

The General Meeting adjourned at 9:18 pm.

SSSP 2015 – Summary in Photos – *Tenho Tuomi*

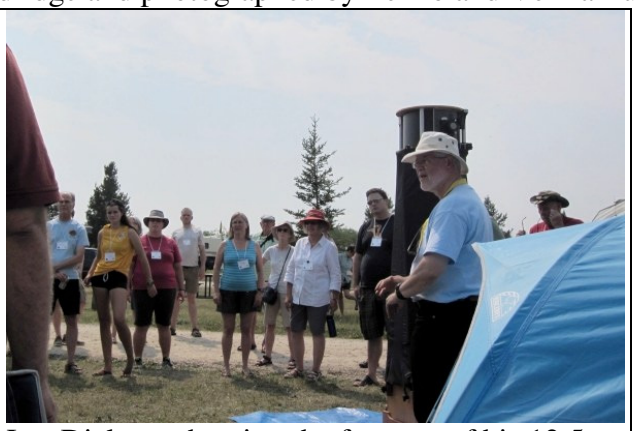
"SSSP had hot days and good nights up to Thursday, though Thursday was a bit smokey. Friday night was cloudy but it cleared for about an hour.

When it started clearing somebody shouted, "Aurora". It wasn't aurora but the Milky Way. The weather cooled off on Saturday and it was cloudy with a little rain, and windy enough to blow the roof off the RASC tent." – *Tenho Tuomi*

"and blew our GM-8 mount and refractor to the ground... busted both the RA and Dec servos/encoders into the box, other damage... Ring and focuser on refractor busted... The cover was properly cinched, so no sails. It survived the wind throughout the night, everything was fine at 1:00 pm when checking our set-up, but that afternoon it came down!
Our folded camp chairs were not blown around -- strange. A few others had collapsed tents and i heard a few Dobs were knocked over, but i didn't see any near our spot." – *Steven Bedingfield*

Telescope Walk-around tour as done by Jim Goodridge and photographed by Tenho and Velma Tuomi

Ellen Dickson showing her 80mm SkyWatcher telescope, the smallest telescope



Les Dickson showing the features of his 12.5 inch truss tube SkyWatcher dob

Doug McIntosh showing his computerized 24 inch f/3.3 StarStructure Horizon w/Lockwood mirror, the biggest telescope

Tenho Tuomi showing his Orion XT12 on a Byers 812 equatorial mount, the biggest equatorial Newtonian

Pierre and Katelyn Schierle showing why they chose this 15 inch Obsession Classic f/4.5 w/Televue Nagler and Ethos Eyepieces, and without goto features

Darrel Chatfield showing all of the improvements that he made to his 12 inch Lightbridge dob, such as a shroud, weights and legs

Registration tent after the wind storm on Saturday afternoon

Telescopes in the Meadows on Friday morning

Rick Huziak giving his talk Thursday night

Solar viewing on Friday morning

Venders at the Swap table on Saturday morning

- The first two photos show the difference in the sky between Thursday and Friday nights, same camera settings.

- The final four photos sequence shows the progress of the clearing on Friday night. Unfortunately the clear sky did not last for much more than an hour. *All photos by Tenho Tuomi*

Farewell as Editor – *Ron Waldron*

It has been my pleasure for the past three years to have been the editor of our club's newsletter. Thank you to the many members and contributors who have made this labor of love easier for me.

This issue is my final issue as your editor. Although its future at the time of this writing appears uncertain, I trust that someone in the club will step up to take over this important task and I want to take this opportunity to wish whoever it is all the best.

Science or Sensation (Pt. 2a) – *Vance Petriew*

Editor's Note: *Because of space limitations in this month's issue, the final part of Vance's article will be presented in two parts – the final part will appear in the October Issue. I apologize for the necessity to edit the second part*

In Part 1, I talked about the Sensation of imaging. The focus of this article will be on the Science of imaging so yes, there will some numbers in this article and yes, those numbers will have meaning. Hands-on is the best way to learn about these numbers but I will do my best to explain them.
Here are a few key points from the first article that are worth mentioning again as a refresher.

1) Professional astronomers do real science with their images. So can amateurs.
2) A digital image is really a grid of numbers.
3) Stacking images is the adding together of numbers measured by each camera pixel.

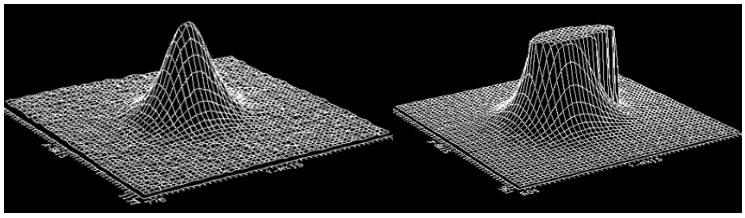
The goal with taking pretty pictures is to get as much Signal-to-Noise ratio (SNR) as possible by taking many long exposures to give enough time for the faint details to register on the camera. In my 7.2 hour image of M81, all my 3-minute images were stacked on top of each other to create a large SNR. Of course, the background sky is not consistently dark so if you want to record the faint details in your image, you'll want to take your images under a dark sky. Things like street lights, clouds, aurora and the moon are all light sources that can brighten the background sky and wash out the faintest details. My imaging run was done during a new moon cycle from a suburban location with no clouds or aurora. Therefore I was able to capture some of the fainter details of M81.
If you haven't guessed it by now, yes, there was something else was going on in those images of M81; something that you would not be able to see by just looking at a picture. It's something that happens on the time scale of minutes and only by taking many sequential images can this be revealed.

In the previous article, I had left a clue as to what I might be talking about in the second article. The clue was the title of the 3rd image showing the fainter details of M81. The title of the image is ES UMA which is the variable star found in the same field of view as M81. ES UMA is a binary star system where there are two stars orbiting around each other. From our view here on Earth, the two stars pass in front of each other creating eclipses which we can see and measure.
But before we get into investigating this variable star, we first have to understand a bit about the grid of integers that make up a digital image and the camera that took them. My SBIG ST7-XME CCD camera is specifically designed for astronomy. It is a 16-bit camera which means the range of values each pixel can have is between 0 and 65535 (2^16). Most consumer cameras are either 12-bit (max count = 4095) or 14-bit (max count = 16383). All of these will work for science if certain processes are followed. To find out the pixel values in an image, you

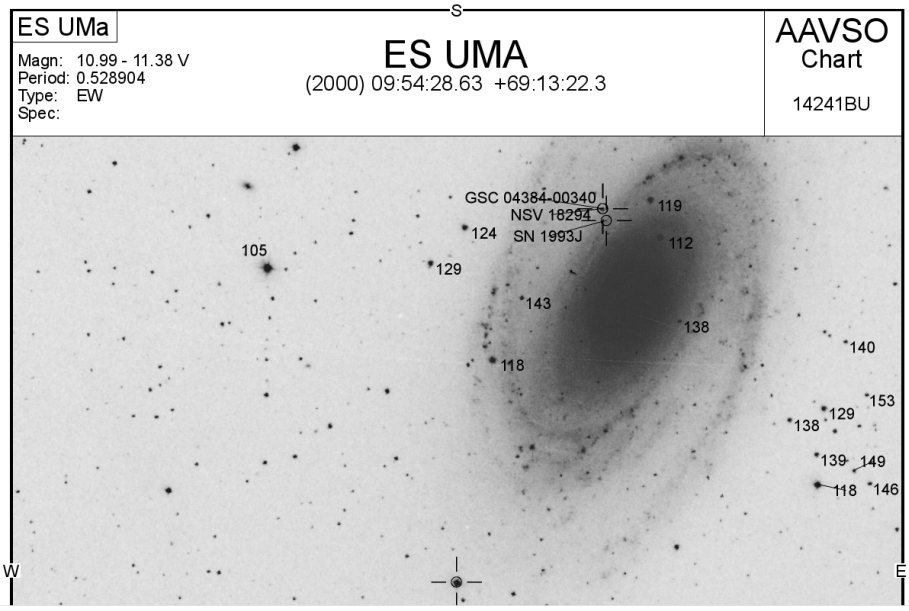
will need some astronomy imaging software. I use Maxim DL but if you want something free to start with, then download the Aperture Photometry Tool.
In order to do science, there are two things I need to know to ensure I have good and consistent numbers in my images. The first one is an exercise to learn how the camera records light.

1) Find out how linear your camera is at recording light.
2) Set exposure times that keep the pixels from filling up to the top. This is called saturation.

Without going into details on the process, it is suffice to say that I've tested my camera and found that it records light in a linear fashion up until the pixel values reach a count of 45,000. Above 45,000, the numbers become less accurate as the values get closer to 65,000. This tells me that I need to set my exposure times so that the maximum pixel values for my stars stay below the 45,000 threshold. Doing so will create consistently measurable results.
Saturation happens when a pixel fills up to the top. In my camera, this would be anything above about 58,000 counts. The picture below is an example of a non-saturated star and a saturated star. The saturated star has a flat top. The pixels are full and can't record anymore light. Now imagine what happens if you try to put 120 liters of gasoline into a 100 liter gas tank. The extra 20 liters will not fit and will spill out. In a CCD camera, the extra spillage flows over into neighboring pixels causing their values to increase faster than they should. This is called blooming. Unfortunately, no science can be done with bloomed pixels because the values have been contaminated and are now inaccurate.



Now that we know that the pixel count needs to stay in the linear zone below 45,000, let's take a look at the M81 star field. It just so happens that M81 occasionally has a supernova go off in it. The last major one was in 1993 (http://www.nfo.edu/m81.htm). Because astronomers want to accurately measure supernovae, some of the stars in the M81 field have had their brightness measured very accurately. These reference stars be used as measuring sticks for other stars in the area. The chart below was generated by the American Association of Variable Star Observers (AAVSO) Variable Star Plotter (http://www.aavso.org/vsp). If you want to re-create the chart below, enter in the chart number (14241BU) into the ChartID field on the VSP form and click "Plot".



On the chart, we can see the beautiful spiral galaxy, M81. Along the edges, you will notice the direction indicators that show south at the top and east at the right. That means this is an inverted image which just so happens to match the view in my telescope. Also on the chart are stars with numbers beside them. These are the accurately measured reference stars in this field. The numbers represent the magnitude of the star with the decimal left out so the decimal is not confused with a star. The variable star, ES UMA, is indicated by the cross hairs at the bottom of the image. Comparing this chart to my images, I determined that the best reference star for me to use was the 105 star.

to be continued …

International Observe the Moon Night

Dark Skies at the Creek - September 19 from 8 pm - 1:30 am

Come and celebrate *International Observe the Moon Night* with the Royal Astronomical Society at Beaver Creek Conservation Area. Visitors can learn about the night sky from local astronomers and telescopes will be set up for public viewing. Come and meet the Bat Girls, Batrick and Elizabat, at 8 pm to learn about our nocturnal animal friends that live at the creek. Visitors can also learn about nocturnal wildlife on our night hikes which will be held at 10 pm and 12 am. For more information please call 306-374-2474.

Observer's Group Report – *Larry Scott*

Farewell to the short, bug-infested, smoke-filled nights of summer. Hello to the crisp, clear nights of fall.

Observer's Groups for June 13th and July 18th were both cancelled due to weather conditions. There were a few of us out on June 20th for a very short night of observing. Finally, on August 8th, we had a gorgeous night for observing with seven members and guests showing up. Mosquitoes were thick and humidity was high, but the skies were very good. There was a little bit of everything with planets, meteors, some nice aurora briefly, and excellent deep sky viewing if you stayed well above the horizon. Last but not least was a trip to Cypress Hills.

A fine, clear sky greeted us the first night of SSSP which coincided with the Perseid meteor shower. I tried to keep my eye to the eyepiece, but the meteor shower turned out to be too hard to resist and I spent most of the night not using my telescope. Thursday was good but viewing ended early due to clouds. Heat and clouds continued their march through south-west Saskatchewan for two more days until clearing up on Sunday and allowing some more viewing for the remaining stragglers. There was also a little wind on Saturday and I hope eveyones scope survived the ordeal. I was able to stay a few extra days and my patience was rewarded on Tuesday night with a great nights viewing from the dark-sky campground. Humidity was very high and I had to hide my scope under a tarp to keep from getting fogged up. The payoff for my efforts were some great views at the eyepiece till everything dewed up at 02:45.

Our fall activities kick off with Observer's Group on September 12th. There will be an Observe the moon event at Beaver Creek September 19th and a lunar eclipse on Sunday the 27th.

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. Jeffrey, D. Chatfield, B. Christie, K. Noesgaard, M. Stephens, B. Hydomako, T. Tuomi, L. Scott, G. Charpentier, B. Johnson, M. Clancy, L. Dickson, B. Burlingham, K. Houston, Norma Jensen

Ron Waldron	108
Wade Selvig	75
Garry Stone	57
Bernice Friesen	45
Wayne Schlapkohl	43
Barb Wright	40
Ellen Dickson	34
Jeff Swick	24
Graham Hartridge	9

Chatfield BINOCULAR CERTIFICATE
Certified at 35 to 40 Objects:
M. Stephens, T. Tuomi, M. Clancy, R. Huziak, K. Maher

Jim Goodridge	12

FINEST NGC CLUB
Certified at 110 Objects:
R. Huziak, D. Jeffrey, G. Sarty, D. Chatfield, T. Tuomi

Larry Scott	110
Scott Alexander	97
Norma Jensen	83
Sandy Ferguson	23
Kathleen Houston	23
George Charpentier	13
Mike Clancy	7

EXPLORE the UNIVERSE
Certified at 55 to 110 Objects:
M. Clancy, T. Tuomi, K. Maher, B. Gratias

Wayne Schlapkohl	55
Jim Goodridge	35
Sharon Dice	31

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

Norma Jensen	140
Jeff Swick	29

HERSCHEL 400 CLUB
Certified at 400 Objects:
D. Jeffrey, R. Huziak, D. Chatfield, T. Tuomi

Gordon Sarty	251
Scott Alexander	117
Sandy Ferguson	18
Larry Scott	20

HERSCHEL 400-II CLUB

Darrell Chatfield	400
Tenho Tuomi	398
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: **http://homepage.usask.ca/%7Eges125/rasc/Chatfield_Binocular_List.pdf**
"Isabel Williamson Lunar Observing Program Guide:
http://www.rasc.ca/observing/williamson-lunar-observing-certificate
Program details can be found at: **http://www.rasc.ca/williamson/index.shtm**