Saskatoon Skies

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

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This photo was taken on January 19th by Ron Waldron of the occultation of Aldebaran. Aldebaran is located to the left of the moon. Taken with a Canon T2i, 1/30s, ISO800, f/4.5

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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 https://www.usask.ca/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!

SASKATOON CENTRE'S
MAIN OFFICERS:

Interim President – Les Dickson
Vice-President – to be filled
Secretary – Tenho Tuomi, 306-858-2453
Treasurer – Norma Jensen, 306-244-7360
National Council Rep – to be filled

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
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 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!**

A separate by-mail subscription to Saskatoon Skies is available for $15.00 per year. 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 krisohn@gmail.com for rates. Members can advertise non-commercial items free of charge.

RASC CALENDAR OF EVENTS

Feb 22	**RASC General Meeting**	Les Dickson
Mar 5	**Observers Group**	Larry Scott
March 21	**RASC General Meeting**	Les Dickson
April 2	**Messier Marathon (Observers Group Night)**	Larry Scott
April 9	**Messier Marathon (Observers Group Night)**	Larry Scott
April 18	**RASC General Meeting**	Les Dickson
May 7	**Observers Group**	Larry Scott
May 16	**RASC General Meeting**	Les Dickson

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
on

Monday, February 22nd, 2016 at 8:00PM

Presented by Les Dickson:

20 Years of SSSP:

A Retrospective from the Inside

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

Minutes of the January Executive and General Meetings
– Tenho Tuomi

Minutes of the Executive Meeting, January 18, 2016

The Executive Meeting was called to order by President Les Dickson at 7:04 pm.

Moved by Norma Jensen and Tenho Tuomi that the minutes of the November 18, 2015 Executive meeting be approved as circulated. Carried.

It was noted that discussion regarding mailing the newsletter was omitted from the minutes.

Committee Reports:

- President's Report by Les Dickson. Thanks for those who voted and ran for the executive at the last meeting and election. Our new Events (or Activities) Co-ordinator is Dale Boan who volunteered at the November meeting.
- Newsletter Report by Kris Ohnander. Next deadline February 5. Contacted the Western Producer regarding the article in the last newsletter.
- Telescope Rental Report by Errol Frazer-Harrison. The 6" scope has been returned and upgraded by replacing the broken mount with a new goto mount donated by Nigel West. $59.95 was spent for new counter weights. Set of four eyepieces, donated by Dale Parker, are available for rent.
- SSSP report by Les Dickson. Planning is moving along nicely. The three major speakers have been re-confirmed. Andrew Kostiuk is working on a more friendly SSSP website that hopefully will accept registration payments.

Other Business: Mass email mail-out for announcements. Announcements should be approved by the President.

- Financial Statement by Norma Jensen and Jim Gorgoff. . Year End financial statements will be ready by February 1.
- Open Executive Positions. We still need a Vice-President, National Council Representative and Fundraising Co-ordinator. We could also use a Social Media Co-ordinator.
- Affirm composition of committees. Defer to next meeting.
- Open SSSP committee positions. We need a Meadows Co-ordinator and a Volunteers Co-ordinator.
- Centre meeting speakers. February 22 – Jim Goodridge. March 21 – Les Dickson. Main speaker needed for both. Should get Astronomy students as speakers.
- Centre resources: where are they, who has them, can we get them together?
- Centre keys: University, coffee locker, others.
- Wild about Saskatchewan (Nature City Festival) May 24-29. Volunteers needed to set up a booth and solar scopes.
- Other up-coming Events. Earth Hour in March.
- Volunteers for Sask. Parks astronomy programs in 2016. Volunteer and get free camping plus honorarium.
- 50th Anniversary of our Centre in 2018. Start thinking about what we can do to celebrate.

The meeting adjourned at 8:57 pm.

Minutes of the General Meeting, January 18, 2016

The General Meeting was called to order by President Les Dickson at 8:13 pm.

Moved by Ron Waldron and Ellen Dickson that the minutes of the November 18, 2015 General Meeting be approved as circulated. Carried.

Les Dickson gave a summary of reports and announcements arising from the Executive Meeting.

Discussion:
Errol Frazer-Harrison reported that the 6" rich field telescope, a 3" refractor and a set of eyepieces are available for rent.

Les Dickson asked members to tell him about any Centre assets that they may have.

After a 15 minute coffee break, Tenho Tuomi gave a presentation on an Astroimaging Committee that he has been on, and the Astroimaging Certificates that they have been working on. Discussion followed.

Rick Huziak gave a presentation on the 103th AAVSO Meeting in Woburn, MA, and why we should all be members.

The meeting adjourned about 10 pm.

Update on SSSP 2016 – *Les Dickson, Chair*

SSSP is off and running for another year, our 20th!

At the end of January, we opened up our new website, designed by Andrew Kostiuk. The main page for the star party is at http://www.usask.ca/rasc/starparty.html . There you will find a link to the SSSP 2016 web site at http://sssp2016.akostiuk.net/.

The schedule for opening up Camping and Registration is dictated this year by the upcoming provincial election April 4. The Saskatchewan Provincial Parks' Reserve-A-Site will not open until after the election, on April 16th. The park management is letting us use the Meadows again as a nearly exclusive observing and camping site. We appreciate them letting us do this so soon after the high point of their season, the August long weekend. As we have done before, the park will block out about 110 campsites that we will assign to our attendees on a first-come first-serve basis. Registration will open on or about the 16th. We hope to have our web site organized such that the registration form can be filled out on-line and we can process electronic payments.

The SSSP committee, which so far includes myself, Ellen Dickson, Rick Huziak, Darrell Chatfield and Andrew Kostiuk, needs your help. We need volunteers to fill two very important positions: Meadows Coordinator and Volunteer Coordinator. The Meadows Coordinator is in charge of everything that happens in the Meadows, including set-up and take-down of the registration tent, security, lighting, and anything else that needs doing to make it all work smoothly. We also need a Volunteer Coordinator to organize the many on-site volunteers we need to make it all happen. Contact me or Rick if you are willing to help plan and organize SSSP for the coming year.

Presidents Notes – *Les Dickson*

February is a busy month as we start to organize for the Spring and Summer events. The first event of note is Earth Hour, March 19, 7:30 pm to 8:30 pm at the east side portion of the Circle and Eighth Mall on 8th Street. Bring your telescopes and/binoculars and show the mall goers what can been seen when the lights go out! I want to thank Dale Boan and James Gorkoff for their work on organizing this event, and Bob Johnson in the Mall's administration for working with us again this year to bring the stars out.

I wish to thank Jim Goodridge for volunteering to give a short talk our meeting this month on "A Substitute for the Night Sky Observer's Guide".

It is a perennial problem finding speakers for our meetings. As Rick Huziak has said, there are 70+ members in our Centre; if each person volunteered to a short talk, we would be covered for 7 years! Please contact me if you would like to do a short talk on anything astronomical. Also, we need main speakers. We could not find someone to come in and talk this month, so I am doing a talk on the history of the Saskatchewan Summer Star Party. If anyone has suggestions on people to contact to give talks, I would appreciate it. You can also volunteer to give one yourself.

We are still short critical people on our Executive. We need a Vice-President and a National Council Representative. I am hoping some volunteers will step forward to fill these important positions. We also need your help in running SSSP this year. Talk to Rick Huziak or myself if you are interested.
At our Executive meeting we will be considering an offer from *SkyNews* magazine to allow us to purchase copies of *SkyNews* for the cost of shipping ($0.50/copy) to hand out at star parties and public outreach events. I would like the Centre to purchase 100 to 200 copies for those purposes as they could be handed out to non-RASC members at SSSP, at Astronomy Week events and at the Sleaford Open House. We could also give copies away to temporary members when they sign up with us. Come to the meeting and share your ideas.

The Observers Handbook Carbon Star List

– *Rick Huziak*

On page 295 of *Observer's Handbook 2016* you can find the *Carbon Star*s list. The list first appeared in the 2011 *Handbook*, authored by Ron Ostromecki. Although my early observing days 35 years ago included a fascination with carbon stars (see below), my interest in the *Handbook* list started when Chris Beckett of the Regina Centre asked me to comment on the accuracy of his description of a few variable stars that he had written about for an article that was soon to appear in *Featured Constellation: Auriga,* pp. 272 – 273 of the 2014 *Handbook*.

By coincidence, the variable stars he had mentioned, UU Aur and R Aur, were old friends of mine from my variable star observing program and I immediately noticed that the variation range for UU was incorrect. When I inquired where Chris had obtained his data, he directed me to the *Handbook Carbon Stars* list. A quick scan of the list showed immediately that there were a few problems present in the data. For example, even though the column header indicated the magnitudes were "m_v" (V-band) it

seemed that the data for different stars was taken from photo-visual (pv), red (R), and infrared (IR) bands. In addition, there were many missing spectral types, and the spectral classification was quite old. The carbon star classification had been completely revised in recent years to better describe the physical parameters. I also found a nonsensical truncated name, a star with a wrong position and a star that is not a carbon star. Furthermore, two of the most astrophysically-important carbon stars were not on the list.

To understand the inconsistencies, I contacted the author. Ron explained that he had created the list from several sources and did not really check the integrity or consistency of the original data. The list was intended to be an "observing list" for colourful red stars that you could chase down, similar to the Messier list for fuzzy things.

The largest problem I saw with the list was the inconsistent magnitude scale. Since carbon stars are so red, a photo-visual magnitude and a red or infrared magnitude can easily be discrepant by 3 or 4 magnitudes. If the list was for visual observers, then the discrepancy would cause much confusion for identification of the star in the field. For example, UU Aur was given as having a range of 7.8 – 10, whereas the actual range is 5.1 – 6.6V - an approximately 3-magnitude difference! It was clear to me that the 7.8 – 10 range was an old photo-visual range measured off of an ancient blue-sensitive plate decades ago. It made a lot of sense to me that the list should be standardized to visual (V) magnitudes for all of the stars, since eyes "see" centred in the visual (yellow-green) part of the spectrum.

I thought about the list for a few days, then contacted Ron again to ask him if he'd mind if I updated the list to make it consistent, to double-check the data, and to fill in any missing information. Ron agreed, so I checked all of the stars to the *Spectral Atlas of Carbon Stars* (Barnbaum, et al., 1996), available in the Simbad/VisieR database, replaced all spectral types with the revised Morgan-Keenan C-system (1993), and filled in all missing spectra. At the same time, I chased down the original magnitude bands (p, mv, V, R, IR, etc.), and where available, substituted in the V magnitude. Not all stars had readily available V-band data available, but there are a few ways that this can be calculated or found. All carbon stars are pulsating giant variable stars, and because they are both interesting to amateur astronomers for their intense colour and of astrophysical interest because of the molecular physics happening in these stars, carbon stars are generally well observed. So I also checked the stars to the AAVSO International Database and was able to confirm V-magnitudes and improve or add the actual observed historical range of variation for about two-thirds of the stars. Where AAVSO data wasn't available, I *calculated* the V-magnitude range by applying offsets from V-I (Visual – Infrared) or V-R (Visual – Red) values found in the carbon star paper.

I had intended just to give the improved list back to Ron and forget about it, but Ron and *Handbook* editor Dave Chapman insisted that I become a co-author. So my debut as the co-author first appeared with the revised list in the 2015 *Handbook*. The whole job only took a few evening to do, since the data is readily available in modern databases that are easy to access. The problem comes when bits of data are taken from here and there, and do not come from professional databases. Data in planetarium program or in other "Internet" lists are inherently poor, old and inconsistent.

So … back to carbon stars. Observing the *Carbon Stars List* is a worthy project since the list will teach you much about the universe around you. Besides, carbon stars are just plain pretty. Whereas most things in the sky can best be described in subtle or pastel colours, including double stars, most carbon stars are *intensely* red. Some, (those with the largest B-V values), are so red that they cause observing problems. Their red colour is due to the copious production of carbon dust in their cool upper atmosphere that then absorbs the light from the star and reemits it preferentially as "heat" in the red and

infrared parts of the spectrum. Some of the stars even puff out clouds of carbon that can create shells that dim and obscure the stars for months of years.

My interest of carbon stars started with *Celestial Objects for Common Telescopes, Volume 2: The Stars*, by the Reverend T. W. Webb and T. E. Espin from Dover Publications, 1962, a reprint of the 6th edition from 1917. Former Director of the AAVSO, Margaret W. Mayall edited and revised the 1962 edition, and I picked up a copy in the University of Saskatchewan bookstore in 1976. Each constellation listed *Stars with Remarkable Spectra and Variable Stars*, and within the list were many carbon stars. These remarkably red stars had already caught the interest of visual observers by the early 1800's, way before their significance was truly understood. They indeed were "just pretty" to look at! Many of the stars in the book eventually morphed into variable stars that I observed for decades afterward.

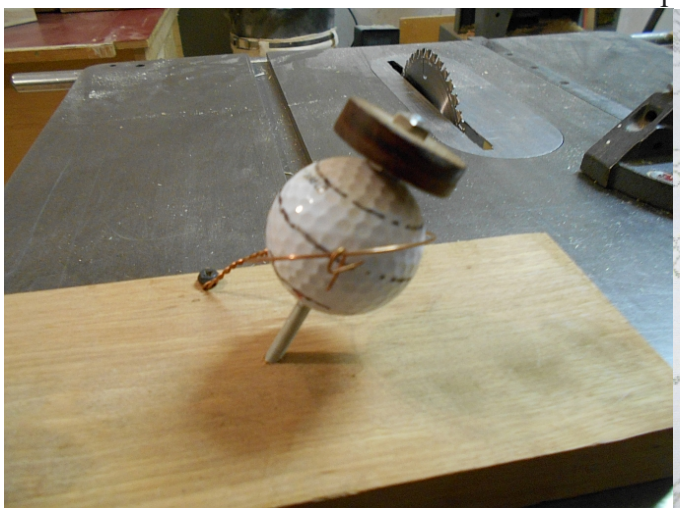
So if you choose to observe these stars, here are a few tips. You can observe them just to track them down and check them off of the list, or you can do a bit more with them. As you track each one down, identifying them in the field is generally not that difficult (and far easier now that the magnitudes are correct in the list), since you basically look for the *really red* star. If you haven't seen a carbon star, you will surely be surprised as to how red most really are. Among the sea of white stars a red point just *blips* into view – they really catch your attention! This redness soon demonstrates the *Punkinje Effect*, and as you stare, the star seems to become brighter and brighter. This happens because night time vision shifts toward a peak in blue light using rods, but the intense red of the carbon star is enough to trigger a day-like reaction in the cones. (For a full explanation, see *Wikipedia*.) The unconscious visual system confusion created by the colour difference causes many observers to over-estimate the brightness of the star as compare to the "white" comparison stars.

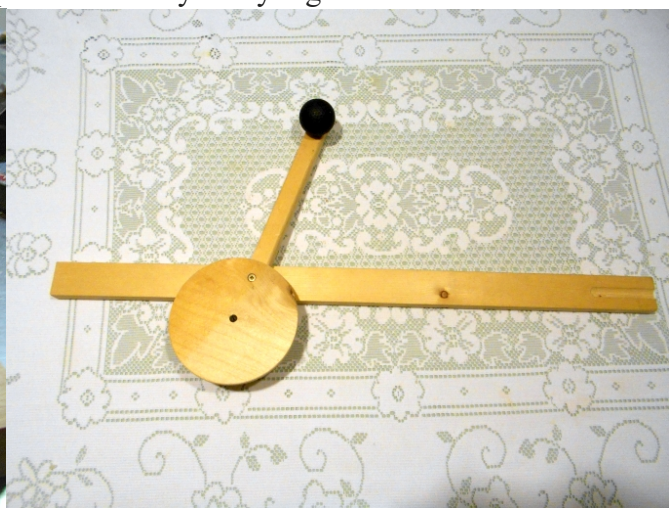
I do encourage observers not just to find that stars, but also to be aware they are variable and could be at any brightness within the range when you look at them. So it is fun to figure out how bright they are, thus doing a brightness estimate is fun and useful. Then returning to the star in a few weeks and seeing the brightness change is also interesting and useful. Over half of the stars will have comparison sequences for the fields, so downloading a chart from the www.aavso.org/vsp/ website allows the generation of a very useful finder chart, and often, a sequence by which to estimate the brightness. However, new or unwary observers often overestimate the brightness by as much as two magnitudes due to the *Punkinje Effect*! (Plot the light curve for RS Cyg for the last 2000 days at www.aavso.org/lcg/ and notice how scattered the data is!) To avoid overestimating very red stars, defocus the stars to disks to dilute the colour effect, then compare the brightness of the stellar disks. Also make the estimate as quickly as practical, before your eye has time to begin seeing the red colour.

And just a closing word about this project: *Observer's Hand*book is used all over the world by amateur *and professional* astronomers, so the content really needs to be accurate and complete. The *Handbook* is internationally-recognized for its content and quality, so is found in the control rooms of a great many professional observatories around the world. I've seen it at the AAT in Australia in 1985, Kitt Peak National Observatory in 2003 and the US Naval Observatory in 2004. Being involved in the *Handbook* is also an honour and a chance to get to know other authors and contributors from all over the world. As it happens, the *Observer's Handbook 2016* has 67 contributors. I have communicated with 40 of the authors, personally know 33, and 3 are, or have been, Saskatoon Centre members.

Garry's Gadgets – *Garry Stone*

Garry Stone built this little teaching gadget (left) to show a friend why we do not see the International Space Station (ISS) in the same place in the sky every night. The rotating golf ball represents the earth, and the wire loop around it represents the orbit of the ISS, which is inclined 51.65 degrees to the equator. This is the latitude of the highway from Outlook to Kenaston. The ISS would never appear overhead north of that. The ISS makes an orbit about every 93 minutes. As the ISS makes its orbit, the earth rotates about 23 degrees during that time. That is why the ISS goes over a different part of the earth on each orbit and we do not see it in the same place in the sky every night.





Garry Stone made this (right) to show how the moon and earth rotate around a common centre of gravity. As the moon goes around the earth, the earth also makes a small rotation. This display is not exactly to scale but it shows the idea. Somebody suggested that the stick that they are mounted on should be curved to show their orbit around the sun, with the earth wobbling as it follows the orbit.

Observer's Group – *Larry Scott*

There was an opportunity to observe the night sky on Saturday, January 30th and five members made it out to Sleaford to do just that. Skies were clear with a band of clouds to the south, temperature was -4C at sunset and wind was 15km out of the west. The light breeze made the skies somewhat turbulent and transparency was average. For a January evening in Saskatchewan it was gorgeous. The yard had been cleared the week before so all we had to do was set up and enjoy the sky. Comet C/2013 US10(Catalina) was big and bright in Ursa Minor and rose higher as the night progressed. I observed it for half an hour as it passed through a small area of the sky. After about five minutes its motion was apparent and I revisited it several times during the evening. Several members were taking photographs and I look forward to seeing their efforts elsewhere in this issue. It was a fine evening and we were able to observe till Moonrise at 01:15. At the same time a band of clouds from the North drifted over resulting in some interesting cloud formations lit from the bottom by Moonlight. Good Night!

Our next dark-sky period begins around February 26th and runs till about March 11th. We have scheduled an Observer's Group for March 5th and it would be great if you would all come out.

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
Larry Scott	*New!*	45
Sandy Ferguson		18

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**