

# Saskatoon Skies

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

Vol. 44, No. 3

March 2013



Members will be voting on a Club House (garage package) or storage shed to be purchased and constructed at our Sleaford Dark Sky Observing Site near Colonsay. See more detailed information about both options on page 8 in this issue.



Saskatoon Centre  
The Royal Astronomical Society of Canada  
P.O. Box 317, RPO University  
Saskatoon, SK S7N 4J8

WEBSITE:

<http://www.rasc.ca/saskatoon>

E-MAIL: [skstars@shaw.ca](mailto:skstars@shaw.ca)

To view *Saskatoon Skies* in colour, see our Website:

<http://homepage.usask.ca/~ges125/rasc/newsletters.html>

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# MEMBERSHIP? JOIN TODAY!

**Regular: \$80.00 /year**

**Youth: \$41.00 /year**

**Associate: \$33 /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 <national@RASC.ca>!

## 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
  - 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](mailto:norj@sasktel.net).

## U OF S OBSERVATORY

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

### Observatory Hours:

January-February	7:30-9:30 pm
March	8:30-10:30 pm
April	9:30-11:30 pm
May-July	10:00-11:30 pm
August	9:30-11:30 pm
September	8:30-10:30 pm
October-December	7:30-9:30 pm

## SASKATOON CENTRE'S MAIN OFFICERS:

**President** – James Gorkoff, 644-1343  
**Secretary** – Tenho Tuomi, 306-858-2453  
**Vice-President** – Jim Goodridge, 370-8530  
**Treasurer** – Norma Jensen, 244-7360

**Bottle Drive &  
Canadian Tire \$**  
By Colin Chatfield

If you cannot make it to a meeting but would like to contribute your Canadian Tire money please call me at 934-7046.

**LIGHT POLLUTION  
ABATEMENT  
WEBSITE AT:  
[www.ras.sk.ca/lpc/lpc.htm](http://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. **Articles can be sent by mail in any format to the Centre's mailbox.** Submitted materials can be returned upon request. Submissions may also be sent by e-mail to the editor at [rmwaldron@shaw.ca](mailto:rmwaldron@shaw.ca) as a .doc, no indents, no tabs, one line between paragraphs. 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!**

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. **DEADLINE for submissions** for each month's issue is the 1st of the month. Saskatoon Skies accepts commercial advertising. Please call the editor 306-665-3392 for rates. Members can advertise non-commercial items free of charge.

# RASC CALENDAR OF EVENTS

March	Begin looking for Comet PANSTARRS close to west horizon at sunset	Rick Huziak
March 2	Observer's Group - Sleaford	Larry Scott
March 9	Messier Marathon – Sleaford	Larry Scott
March 18	Executive and General Meetings -175 Physics -U of S	Jim Gorkoff
March 23	Earth Day – Details TBD	Barb Wright
April 6	Observers Group/Alternate Messier Marathon	Larry Scott
April 18	Executive and General Meetings-175 Physics-U of S	Jim Gorkoff
April 13	STARLAB at Children's Discovery Museum	Ron Waldron
April 19	Stargazing at Lakewood Civic Centre – 8:00 PM	Barb Wright
April 20	Astronomy Day Display – Saskatoon Farmer's Market	Barb Wright
April 20	Stargazing at Beaver Creek – 8:00 PM	Barb Wright
May 4	Observer's Group at Sleaford	Larry Scott

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

General Meeting for all members

March 18<sup>th</sup> at 7:30 PM

Room 175 Physics Building  
University of Saskatchewan

## PROGRAM

**Discussion and Vote on Developing our Sleaford Dark Site**

**Special Video Program introduced by Jim Goodridge**

*Note: there will be an executive meeting at 6:30 PM*



## Notice of Upcoming Expenditure

It is the intent of the executive to have built on the Sleaford Site, a 24' X 30' garage package complete with shingles and siding. The amount spent (delivery and construction) would be approximately \$22,740. (actual amount may be different). A vote on this building project will be taken by the membership at the March, 2013 General Meeting. ***If you cannot attend, please give your proxy vote to a member who will be in attendance.***

In addition, a special resolution by one or more members of the Sleaford Site Committee shall be submitted to the March general meeting as follows:

*"Be it resolved that as soon as reasonably possible, the Patterson Dome be demolished, that the site surrounding the Patterson Dome be prepared to facilitate the installation of a storage building thereon and that a storage building of a size and quality reasonably acceptable to the Joint Sleaford Site Committee be constructed thereon, provided the total costs of all of which do not substantially exceed \$10,000.00."*

## February Executive Meeting Minutes by Tenho Tuomi

1. Chairman Jim Gorkoff opened the meeting at 6:35 PM.
2. Approval of the January 21, 2013 Executive meeting minutes, moved by Les Dickson and seconded by Tenho Tuomi.
3. Treasurer's Report, read by Jim Gorkoff. There is \$4158 in chequing and \$35,683 in term deposits.
4. Vice-President's Report, read by Jim Gorkoff. Soby's gift cards are available as a fundraiser for the Centre.
5. Newsletter Report. Deadline is March 1.
6. Sleaford Report, given by Les Dickson and Darrel Chatfield. The inside of the warm-up shelter still needs work, to be finished by May or June. There is a problem with mice in the dome and roll-off buildings. Darrell accepted a position on the joint U of S/RASC Centre Sleaford management committee.
7. Events Report, given by Barb Wright.
  - March 23, Earth Hour at the Centre Mall with public viewing from 8:30 to 9:30 PM.
  - April 13, Children's Discovery Museum at Market Mall, with a Starlab by Ron Waldron.
  - April 19, Astronomy Day, public viewing at the Lakeview Civic Centre.
  - April 20, Astronomy Day, public viewing at Beaver Creek.
  - May 25, Astronomy Day, display at the Farmers Market with the Nature City Festival.
8. Insurance for all events will be obtained through the National office.
9. SSSP Report, given by Barb Wright and Les Dickson. Website is up and bookings have begun. Speakers have been contacted. Pin design has to be ready within the next month.
10. Centre Rep Report, read by Jim Gorkoff. The new by-laws will up for acceptance by the National Executive on March 23.
11. Light Pollution Report, read by Jim Gorkoff. Work is continuing with the city of Saskatoon for a new city dark sky preserve. Work is continuing at the Cypress Hills Park on their lighting.
12. There will be an election for a new Centre Rep at the March meeting.
13. Jim Gorkoff declared the meeting adjourned at 7:25 PM.

## February General Meeting Minutes by Tenho Tuomi, Secretary

1. Chairman Jim Gorkoff opened the meeting at 7:40 PM.
2. Approval of the November 19, 2012 general meeting minute, moved by Les Dickson and Helen?
3. Approval of the January 21, 2013 general meeting minutes, moved by Jim Young and seconded by Darrell Chatfield.
4. Treasurer's Report, read by Jim Gorkoff. There is \$4158 in chequing and \$35,683 in term deposits.
5. Vice-President's Report, read by Jim Gorkoff. Soby's gift cards are available as a fundraiser for the Centre. Pledges for them are to in by the first part of March.
6. Newsletter Report. Deadline is March 1.
7. Sleaford Report, given by Darrel Chatfield. The inside of the warmup shelter still needs to be finished. Deck needs re-staining. Volunteers needed in May or June. There is a problem with mice in the dome and roll-off buildings and their use is not recommended.
14. Events Report, given by Barb Wright.
  - March 9, Messier Marathon at Sleaford.
  - March 23, Earth Hour at the Centre Mall with public viewing from 8:30 to 9:30 PM.
  - April 6, alternate date, Messier Marathon at Sleaford.
- April 13, Children's Discovery Museum at Market Mall, with a Starlab by Ron Waldron.
- April 19, Astronomy Day, public viewing at the Lakeview Civic Centre. Two or three volunteers needed for tables.
- April 20, Astronomy Day, public viewing at Beaver Creek.
- May 25, Astronomy Day, display at the Farmers Market with the Nature City Festival.
8. SSSP Report, given by Barb Wright. Website is up. Registration will be open by April. Book campsites through email on the web. Book lodge rooms soon. Volunteers will be needed.
9. Centre Rep Report, read by Jim Gorkoff. The new by-laws will up for acceptance by the National Executive on March 23.
10. Light Pollution Report, read by Jim Gorkoff. Work is continuing with the city of Saskatoon for a new city dark sky preserve.
11. Jim Young moved to adjourn at 8:00 PM.
12. After a break Tenho Tuomi gave a presentation on "Showing the Structure of Our Galaxy as Seen from Deep-Sky Objects", using his home-made planetarium program.

## Observations on Observing – by Norma Jensen

Tenho wrote in a recent e-mail to me that his observing times in 2012 were down from previous years. I looked at my 2012 observing log and compared it to 2011. In 2011, I was able to observe 57 times, and in 2012 only 37 times. This seems to be very little viewing.

Reasons? *"Life got in the way while I was busy making plans"* (apologies to John Lennon); or there were poor skies because of wind, cloud, humidity or cold.

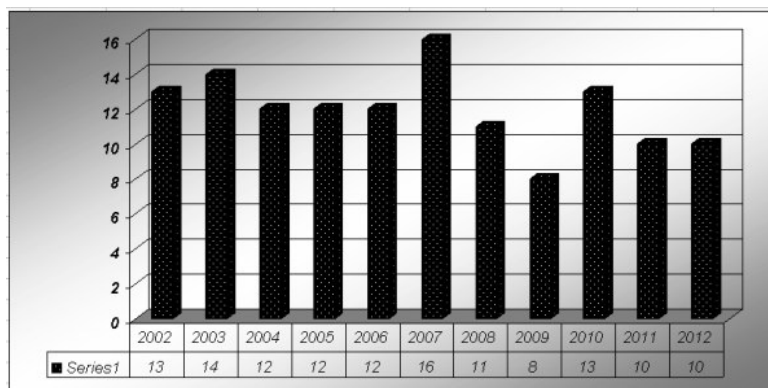
The highlights for me, in no particular order were as follows:

*The annular solar eclipse, 4 nights at SSSP, two amazing dark period nights in April when I saw 14, for me, new galaxies, a fireball at 5:33 a.m. at Muenster one March morning, the duck and the hawk and other animal stories, the Dec 13th Geminids, chasing the clear skies with Gary, Tenho's families to watch the Transit of Venus; and always, aurora that make you sit back and stare!*

Final thoughts? Although opportunities were few, I took them and found great viewing, surprises enjoyed and time under the night sky.

## Graphing My Observations – by Tenho Tuomi

Below is a graph of my average observing days/month since 2002. Not all statistics are weather related. The spike in 2007 is when I got my new Canon Rebel XT camera and started into serious astrophotography. The spike in 2010 is when I spent the year on the Isabel Williamson Lunar Observing program. I haven't figured out the reason yet for the slump in 2009. The drop in the last two years may be weather related.



## My Homemade Planetarium Program – by Tenho Tuomi

In the Fall of 2005 I wrote a graphic computer program in which I plotted the Messier objects as they appear in the sky. I wanted to see what the distribution of the Messier objects looked like. The program turned into a simple planetarium program which I showed at a Centre meeting in December of that year. Two years later I gave a presentation of it at the 2007 Saskatchewan Summer Star Party.

The program sat dormant for a couple of years until 2009 when I wrote a 3-dimensional version of it, but did no more with it at that time. This year I dug both programs out and updated them a little, and showed them at the February 11 Centre meeting under the title, "*Showing the Structure of Our Galaxy as Seen from Deep-Sky Objects*".

Since there was some interest in the programs, I am making them available on my astronomy website for anyone who may want to try them. Links to zip files are at <http://www.lex.sk.ca/astro/>. Unzip them to the same directory.

NGC.zip is one megabyte in size. It contains my original planetarium program, NGC.exe. It has stars up to magnitude 3. Its main feature is a 26,000 item deep-sky database which was taken from a 2004 shareware planetarium program called HNSKY or "Hello Northern Sky" by Han Kleijn. <http://www.hnsky.org/software.htm>. It will show the sky in equatorial or galactic coordinates.

M1.zip contains my 3-dimensional version, Messier.exe, along with images taken with my Rebel XT camera. It is eight megabytes. It contains stars up to magnitude 3, but only the Messier and Finest NGC objects. These objects can be looked at in three dimensions, and can be identified by clicking on them, and an image for any of them can be brought up. More instructions are in the help files.

M1-lite.zip is only 163 kilobytes. It contains Messier.exe but no images. All other features work the same.

## RASC Saskatoon and the Children's Discovery Museum

By Jim Goodridge

The Children's Discovery Museum (CDM) in partnership with the Royal Astronomical Society of Canada Saskatoon Centre and Saskatoon Public Schools will be kicking off International Astronomy Week on Saturday April 13 with free public shows in STARLAB.

Our very own Ron Waldron will be giving shows in STARLAB as part of International Astronomy Week. The Children's Development Museum has secured extra space at Market Mall so that Ron can bring the excitement of the portable planetarium to all of the citizens of Saskatoon. Saskatoon Public Schools has very generously allowed the use of their STARLAB free of charge for this endeavor.



For those who might not know, Ron ran the STARLAB shows for Saskatoon Public Schools until his retirement. Ron also spent time on an internship at the planetarium in Winnipeg and has also done much studying of planetarium operations throughout North America. If Saskatchewan has a "Mr. Planetarium" it would have to be Ron Waldron.

This will be an exciting event and will attract many people from outside of our usual target groups. RASC Saskatoon will have a table in the same room as STARLAB and it goes without saying that we will be getting many questions from people about astronomy and space science. Please mark April 13 on your calendars and plan to attend at Market Mall. The CDM will be pre-booking the STARLAB sessions; their phone number is (306) 683-2555.

Dr. Erica Bird, president of the CDM has a PhD in physics and an undergraduate degree in Astronomy. Dr. Bird will be our guest speaker at the April meeting and will be telling us about the CDM and science outreach to children.

## Observer's Group Notes *by Larry Scott*

And again I write these sad words, the Observers Group for February was cancelled due to poor observing conditions. There was some observing done at Sleaford on February XX. Normally I'd have posted something at our Yahoo! site, but there was another club event scheduled for that night and I didn't want to pull people away. It was, however, the best night I'd seen in weeks so off I went to Sleaford. High humidity and less than steady skies kept me observing open clusters in the southern skies, M41, M46, M47, etc. Clouded out early as well, but glad I went nonetheless.

Upcoming observing opportunities start with the Messier Marathon on March 9th. This has been a very popular event when the skies cooperate. Sunset is 18:58 and you'll want to be set up and ready to go by then. I recommend a little prep time if you're going to take a shot at this.

Shortly after the first week of March comet C/2011 L4 (PANSTARRS) will clear the western horizon at sunset. Ideally you'll want a clear horizon to the west, binoculars, and of course, some clear skies. Check here <http://www.aerith.net/comet/weekly/current.html> for some good info and here <http://cometchasing.skyhound.com/> for a good chart. Best nights should be around March 10th to 13th before the comet starts to fade and the Moon becomes a hindrance. Although fading, it will continue to be visible in our northern skies for months

Next Observers Group is scheduled for April 6th with moonless evenings from about March 29th till April 12th.

# SLEAFORD BUILDING COMMITTEE REPORT - Feb. 24, 2013

*By Darrell Chatfield*

I called a meeting of Jim Gorkoff and Les Dickson on this day to discuss and present the projected costs of putting up a 'club house' and 'tool shed' to the club. I had updated my last quotations from approx. a year ago, and of course, everything has gone up.

Our two hour meeting was good. Ideas were discussed, along with costs, where to put the above items, ground terrain, functionality, etc. Toward the end of it, I actually had a brain wave, something that only happens twice a year! Please look for that below.

So the updated costs I got from the Co-op were as follows:

## **Club House @ 24 x 26'**

- Basic structure, complete with insulation, poly, drywall on the inside, metal siding and metal roof, cement pad, upgraded man door, metal soffit and fascia, 1 window, labour: \$23,000.00
- Additional costs: gravel fill, lighting, wiring and trenching, metal skirting to keep out mice, metal bars on the one window of the club house, **\$8500.00**

## **Tool Shed @ 8 x 10'**

- Basic structure, complete with skid base for now, shingles, vinyl siding, labour: **\$2400.00**
- Additional costs: wiring, lighting, tin cladding on the underside: **\$600.00**

So the rough total for all of the above comes to **\$34,500.00**. Keep in mind, this is an estimate only. This would take up most of the clubs' money in the bank, which I cannot justify. (Long term investments are now \$35,500 ) We still need money to operate the site, pay our share of the joint costs of running Sleaford, etc. So we will always need approx. \$5000 in the bank per year to run Sleaford and maintain the fixed costs of the club.

I also had a talk with Yannis P. on the weekend about their interest in the site. The recent and ongoing budget cutbacks at the U. of S. don't allow for much 'external' site use. Knowing this, if the U. of S. were to sell their roll-off or the whole site to us, we would incur the perpetual upkeep costs associated with that building and the site. It would take some major work to reposition the metal skirting around the building to keep out the mice, and lots of cleaning up inside to make it usable again, which should be done anyways. This is all before the U. of S. Physics department head right now.

It would not be prudent of us to put all of our savings into one or two projects on the site, given the uncertainty of the U. of S. situation.

So here was my brain wave idea. We all know that our Patterson dome is in bad shape due to the mouse infestation it now has, and the fact that the dome no longer rotates and is falling apart. This has to be dealt with anyways! So I thought why not knock it down, and build our tool shed on the **same site??** This has the advantage of getting rid of the dome, and utilizing the existing power run that goes to it. Hence no trenching costs, and a lot cheaper structure to build. Plus, there is easier access to the machinery when needed.

We thought of roughly a 10 x 12 to 10 x 18 shed. This would give us enough mower and blower space, and also allow for storage of some of the usable items in the present schoolhouse. (The size would depend on the infill space we have to the West of our warm-up shelter and to the West of the dome now.)

Our committee was very excited with this fresh idea. Yes, I know there will be demolition costs, costs to possibly cut down the central pier under the dome, etc., some wiring, etc. Just estimating, this could be around \$6000 - \$7000.00 for a shed and the extras, an amount we can well afford!

With all this, I would propose we strongly consider shelving the club house idea, and move forward with tool shed plan.

Here are the things to consider before our March meeting. Please come to the meeting so we can discuss these matters at further length.



# The Planets This Month

*By Murray Paulson*

This month we see **Mercury** return to the morning sky, figuratively speaking. Last month was a great apparition with many chances to view it in the evening twilight. I even caught it in conjunction with Mars, but this month is a different story. On March 4<sup>th</sup>, Mercury passes between the Earth and the sun, passing 3.7 degrees above the sun. At magnitude 4.7, don't even think of it! And it proceeds into the dreaded shallow spring morning ecliptic, so it will rise just before the sun. This apparition is a daytime only event. The Greatest Western elongation occurs on March 31 when Mercury will shine at magnitude 0.2 and 27.7 degrees from the sun. It will show a 7.2" half disc in the eyepiece.

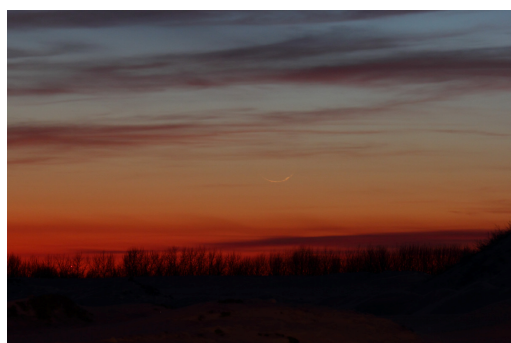
**Venus** spends the month within 6 degrees of the sun, and on March 28<sup>th</sup> will pass 1.33 degrees below it on the far side of the sun. Venus shines at magnitude -3.9 and would show you a 9.68" disc in the eyepiece if you could find it in the sun's glare.

**Mars** lies in the twilight glare 10 degrees from the sun and shines at magnitude 1.1. If you looked at it in a telescope you would see its diminutive 3.9" disc. It will be a tough hunt which will only get tougher as the month progresses. It will be all but invisible for the next 6 months as it comes up to its conjunction next month and on into the summer twilight.

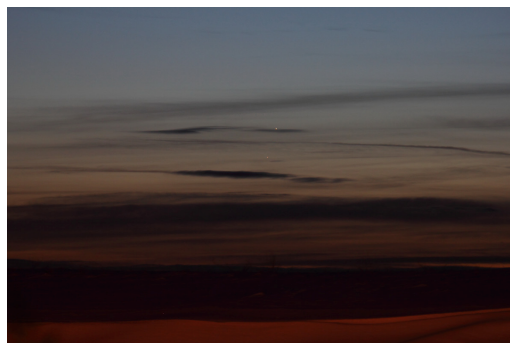
**Jupiter**, the planet that keeps on giving. The other night I had a quick look at it and was blessed with a shadow transit of Io. At the beginning of this month Jupiter shines at magnitude -2.2 and presents a 39.1" disc. It transits the meridian at 6 pm, and it is obvious that it is on its way out. It will linger long enough for Astronomy days next month. On March 17 at 6 pm the Moon will pass 1.75 degrees above Jupiter. It will be about twice the distance of the Christmas conjunction. By the month's end, Jupiter will fade slightly to magnitude -2.1 and shows a disc of 35.8".

At the beginning of March **Saturn** rises just before midnight and steps into the evening sky. It shines at magnitude 0.4 and in the eyepiece shows a 17.9 disc. The rings are tilted up at an angle of 19.2 degrees and present a delightful sight. Over the month Saturn will expand slightly to 18.7" and brighten slightly to magnitude 0.2. It will now rise at just after 9 pm and will sit at 18 degrees altitude in the south east at midnight. Next month Saturn will come to opposition, but more on that later.

**Uranus** is lost to the twilight glare and meets up with the sun on March 28<sup>th</sup> coincidentally with Venus. A mighty hard conjunction to observe! After its conjunction it will move into the morning sky, joining Neptune and the dreadful morning ecliptic will hide it and Neptune until the summer star parties.



18 hour moon – Photo by Murray Paulson



Mercury and Mars – Photo by Murray Paulson

# 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. Hydromako, T. Tuomi, L.  
Scott, G. Charpentier, B. Johnson, M.  
Clancy, L. Dickson, B. Burlingham, K.  
Houston*

Norma Jensen	109
Ron Waldron	105
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	Up!	12
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## FINEST NGC CLUB

### Certified at 110 Objects:

*R. Huziak, D. Jeffrey, G. Sarty,  
D. Chatfield, T. Tuomi*

Larry Scott	Done!	110
Scott Alexander		97
Norma Jensen		61
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	Done	55
Sharon Dice		31
Jim Goodridge	Up!	35

## Isabel Williamson Lunar Observing Certificate

### Certified at 140 Objects:

*T. Tuomi*

Norma Jensen	133
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	Done!	400
Rick Huziak		246

## LEVY DEEP-SKY GEMS

### Certified at 154 Objects:

Tenho Tuomi	149
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.astroloague.org/al/obsclubs/herschel/hers400.html>

Binocular List is at: [http://homepage.usask.ca/~%7Eges125/rasc/Chatfield\\_Binocular\\_List.pdf](http://homepage.usask.ca/~%7Eges125/rasc/Chatfield_Binocular_List.pdf)

Copies of the Isabel Williamson Lunar Observing Program Guide can be purchased at meetings.

Program details can be found at: <http://www.rasc.ca/williamson/index.shtm>